



## CHEMISTRY

### BOOKS - MARVEL CHEMISTRY (HINGLISH)

### HALOGEN DERIVATIVES OF ALKANES (AND ARENES)

#### Multiple Choice Questions

1. Write the IUPAC name of  $(CH_3)_2CH \cdot CH(Cl)CH_3$ .

- A. 2-chloro-3-methylbutane
- B. 3-chloro-2-methylbutane
- C. 3-chloro-3-methylbutane
- D. 2-chloro-3-methylpentane

Answer: A



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2. Give the IUPAC name of :  $CH_3CH_2C(CH_3)_2CH_2I$

A. 2-Iodo-1-ethyl-2,2-dimethylethane

B. 1-Iodo-2,2-methylbutane

C. 1-Iodo-3,3-dimethylbutane

D. 3-Iodo-2,3-dimethylheptane

Answer: B



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3. Give the IUPAC name of :  $p - ClC_6H_4CH_2CH(CH_3)_2$

- A. 3-methyl-1-(4-chlorobenzyl) propane
- B. 2-methyl-1-(4-chlorobenzyl) propane
- C. 2-methyl-1-(4-chlorophenyl) propane
- D. 1-chloro-4-(2-methylpropyl) benzene

**Answer: D**



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4. Give the IUPAC name of :  $CH_3CH(Cl)CH(Br)CH_3$

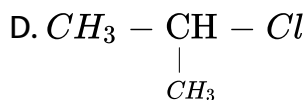
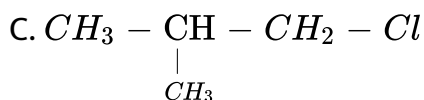
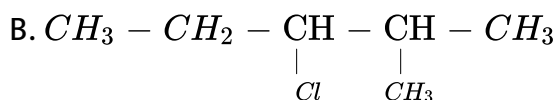
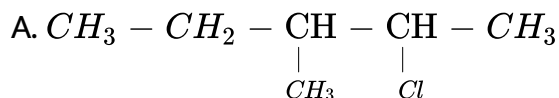
- A. 2-bromo-3-chlorobutane
- B. 2-chloro-3-bromobutane
- C. 2-bromo-2-chlorobutane
- D. 2-bromo-3-chloropentane

**Answer: A**



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5. Give the structure of : 2-chloro-3-methylpentane

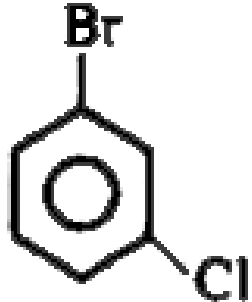


Answer: A

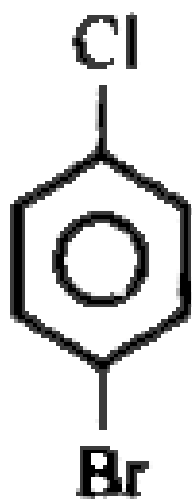


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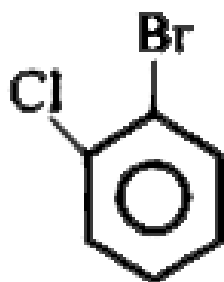
6. Give the structure of : p-Bromochlorobenzene



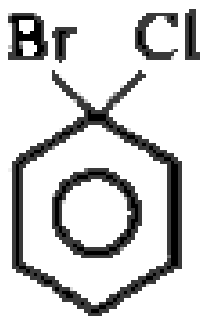
A.



B.



C.

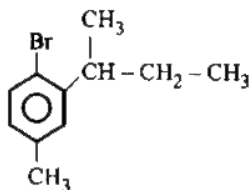


D.

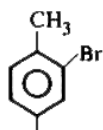
**Answer: B**

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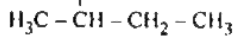
7. Write the structure of the compound 1-Bromo-4-sec-butyl-2-methylbenzene.

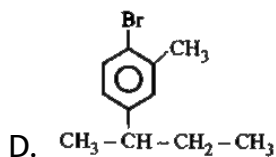
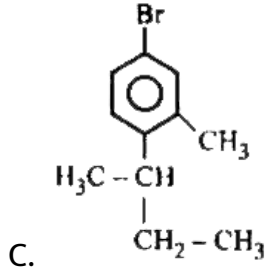


A.



B.





**Answer: D**

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8. The following structure has \_\_\_\_type of halide:



A.  $1^\circ$  Alkyl halide

B. Allyl halide

C.  $3^\circ$  Alkyl halide

D. Aryl halide

**Answer: C**



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9. The following structure has \_\_\_ type of halide 1-Bromo-3,3-dimethyl-1-phenylbutane.

A.  $2^\circ$  Alkyl halide

B. Vinyl halide

C. Benzylic  $2^\circ$  halide

D. Benzylic  $1^\circ$  halide

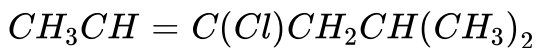
**Answer: C**



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10. The following structure has \_\_\_ type of halide :



A. Allyl halide

B.  $1^\circ$  Alkyl halide

C. Vinyl halide

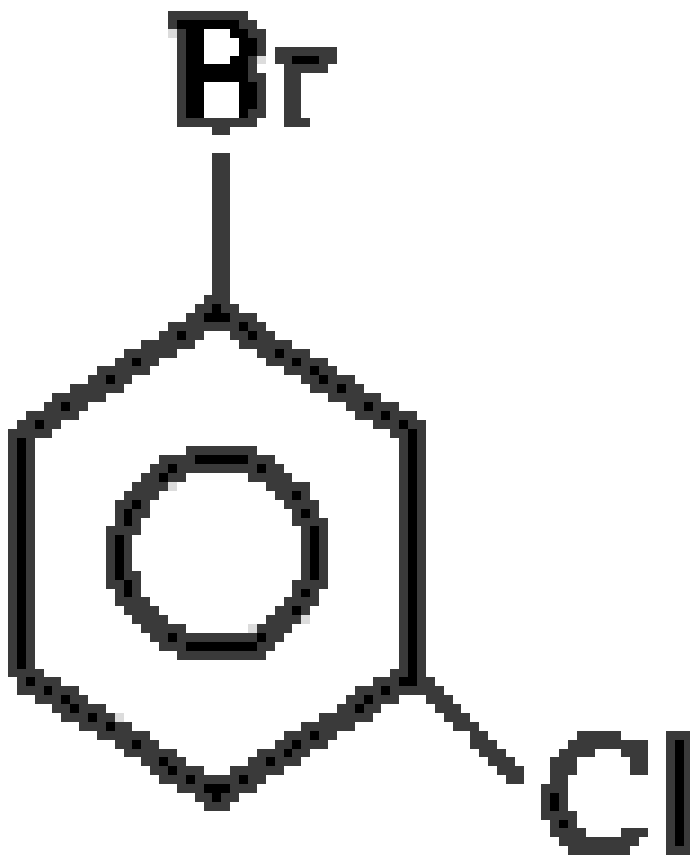
D. Aryl halide

**Answer: C**



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11. Give the IUPAC name of :



A. 3-bromo-1-chlorobenzene

B. 1-bromo-3-chlorobenzene

C. 1-bromo-5-chlorobenzene

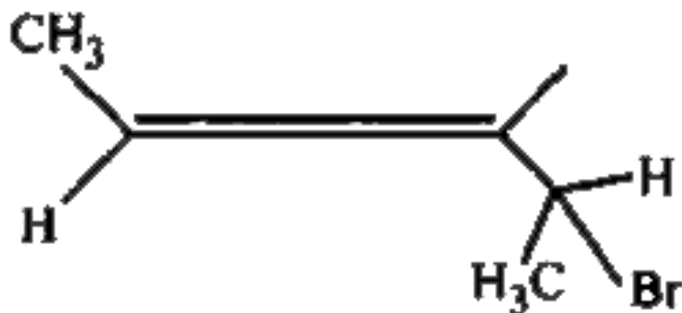
D. 5-bromo-1-chlorobenzene

Answer: B



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12. Give the IUPAC name of :



A. 4-bromo-3-methylpent-2-ene

B. 3-bromo-4-methylpent-2-ene

C. 4-bromo-2-methylpent-2-ene

D. 4-bromo-3-methylpent-3-ene

**Answer: A**

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**13.** Among the following secondary allylic halide is

- A. 3-bromo-2-methylbut-1-ene
- B. 4-bromo-3-methylbut-2-ene
- C. 3-bromo-2-methylpropene
- D. 1-bromobut-2-ene

**Answer: A**

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**14.** Which of the following is a vinyl halide ?

- A. Chloroethene
- B. 1-chloro-3-phenylpropene
- C. 1-bromocyclohexene
- D. All the above

**Answer: D**



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**15.** How many sturcture isomers are possible for a comound with molecular formula  $CH_3H_7Cl$

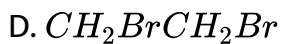
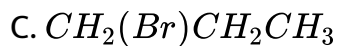
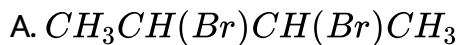
- A. 2
- B. 5
- C. 7
- D. 9

Answer: A



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16. Gem - dibromide is

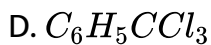
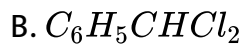
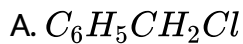


Answer: B



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17. Benzylidene chloride is



**Answer: B**



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**18.** Which of the following halide is *sec ondary* ? .

A. Isopropyl chloride

B. Isobutyl chloride

C. n-propyl chloride

D. n-butyl chloride

**Answer: A**



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19. Which of the following is a primary halide ?

- A. Isopropyl iodide
- B. Secondary butyl iodide
- C. Tertiary butyl bromide
- D. Neo hexyl chloride

**Answer: D**



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20. Which of the following simplest alkanes with fewest number of C atom contains  $1^\circ$ ,  $2^\circ$ ,  $3^\circ$  and  $4^\circ$  C atoms ?

- A. 2,3-dimethylpentane



B. 3-chloro-2,2,3-trimethylpentane

C. 2,3,4-trimethylpentane

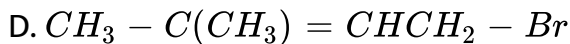
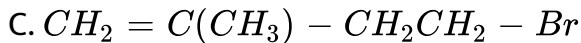
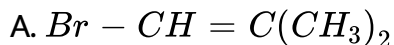
D. 3,3-dimethylpentane

**Answer: B**



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**21.** The correct structure of 4 - bromo - 3 - methylbut - 1 - ene is

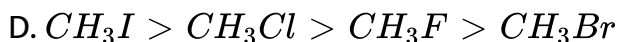
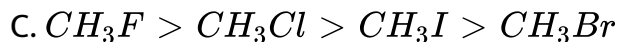
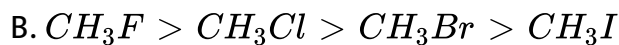
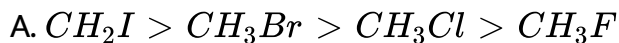


**Answer: B**



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22. The decreasing order of C-X bond length in  $CH_3 - X$  is



Answer: A



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23. Which homologous series is represented by the general formula  $C_nH_{2n+1}X$  (where  $X=Cl, Br, I$ ) ?

A. Haloalkanes

B. Haloalkenes

C. Haloalkynes

D. Haloarenes

**Answer: A**



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**24.** Choose the correct statement about C-Cl bond of vinyl chloride

A. It is shorter and stronger than C-Cl bond of alkyl halides

B. The carbon atom (5) carrying halogen atom is  $sp^3$  hybridised

C. Percentage of s-character is 25%

D. All the above

**Answer: A**



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25. In order to prepare 1-chloropropane which of the following reactants can be employed ?

- A. Propene and HCl in presence of peroxides
- B. Propene and HCl in absence of peroxides
- C. Propene and  $Cl_2$  followed by treatment with aq. KOH
- D. propan-1-ol and  $SOCl_2$  / pyridine

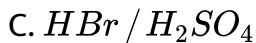
**Answer: D**



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26. For the preparation of n-propyl bromide from n-propyl alcohol which of the following reagent is most preferred ?

- A.  $P_4 / Br_2$

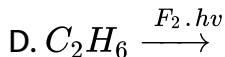
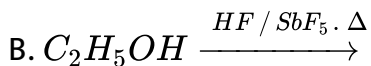
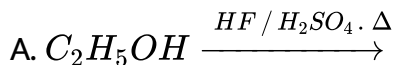


**Answer: A**



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**27.** The best method of prepared fluoroethane is



**Answer: C**



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28. Chlorobenzene can be prepared by reacting aniline with

- A. Hydrochloric acid
- B. Cuprous chloride
- C. Chlorine in presence of anhydrous aluminium chloride
- D.  $NaNO_2 / HCl$  followed by heating with cuprous chloride

**Answer: D**



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29. The product formed when benzenediazonium chloride is treated with  $CuBr/HBr$  is \_\_\_\_\_.

- A. Bromobenzene
- B. Chlorobenzene

C. 1,3-dibromobenzene

D. 1,4-dichlorobenzene

**Answer: A**



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**30.** Which of the following cannot be prepared by direct halogenations of benzene ?

A. Iodobenzene

B. Chlorobenzene

C. Bromobenzene

D. Flourobenzene

**Answer: D**



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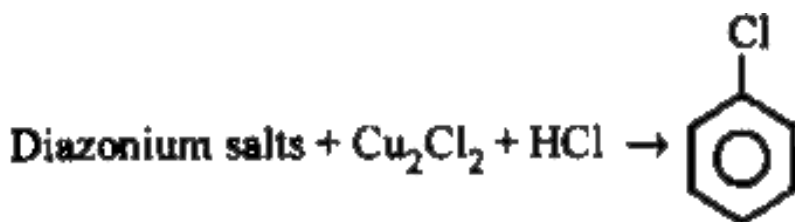
31. The reaction of toluene with  $Cl_2$  in presence of  $FeCl_3$  gives predominantly

- A. m-chlorotoluene
- B. Benzyl chloride
- C. m-chlorotoluene
- D. o- and p-chlorotoluene

Answer: D

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32. Diazonium salts





The reactions is

- A. Chlorination
- B. Sandmeyer's reaction
- C. Darzen reaction
- D. Kharasch reaction

**Answer: B**



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**33.** Which of the following reagents can be used to prepare an alkyl halide from an alcohol?

- A.  $HCl + ZnCl_2$
- B.  $NaCl$
- C.  $PCl_5$

D.  $\text{SOCl}_2$

**Answer: B**



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**34.** Ethyl bromide is prepared from

A. Ethyl alcohol + HBr

B. Ethanol +  $\text{Br}_2$

C. Alcohol + HBr

D. Ethene +  $\text{Br}_2$

**Answer: A**



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35. The catalyst used in the preparation of an alkyl chloride by the action of dry HCl on an alcohol is

A. Anhydrous  $AlCl_3$

B.  $FeCl_3$

C. Anhydrous  $ZnCl_2$

D. Cu

**Answer: C**



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36. Darzen's procedure is the best method for preparing alkyl halide because

A. The reaction goes to completion

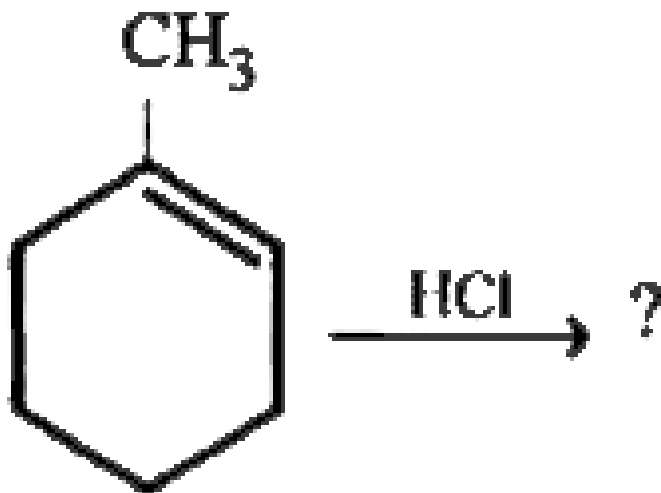
B. The reagent thionyl chloride is cheap

- C. Both the byproducts are gaseous and escape easily leaving behind pure alkyl halide
- D. The reaction of alcohol with  $PCl_3$  is reversible

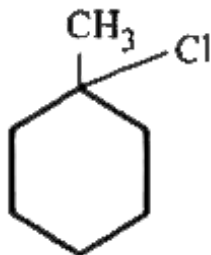
**Answer: C**

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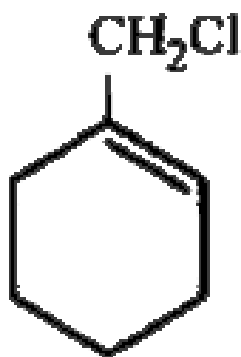
37. For the reaction



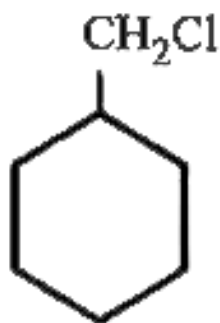
The product formed is



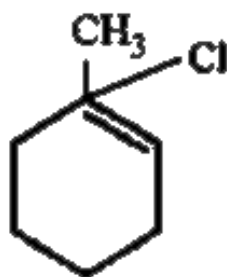
A.



B.



C.



D.

**Answer: A**



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**38.** Sandmeyer's reaction of diazonium salts is a replacement reaction of  $N_2$  by

- A. Halides
- B. Hydroxyl group
- C. Hydrogen
- D. Azides

**Answer: A**



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39.  $C_2H_5Br$  can be obtained in the laboratory by the action of ethyl alcohol with :

A.  $KBr$

B.  $BNH_4Br$

C.  $Br_2$

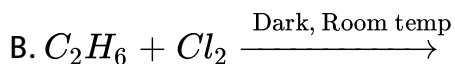
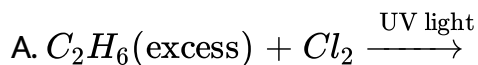
D.  $KBr$  and conc.  $H_2SO_4$

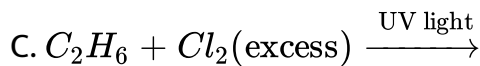
Answer: D



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40. The reaction conditions leading to the best yield of  $C_2H_5Cl$  are





**Answer: A**



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**41.** The reagents required to obtain 1-iodobutane from 1-butene is / are

A.  $I_2$  / red P

B. KI

C.  $HI / H_2O_2$

D.  $HBr / H_2O_2$  and KI/acetone

**Answer: D**



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42. What is function of  $\text{HgO}$  in the preparation of alkyl iodide ?

- A. Catalyst
- B. Neutralise HI
- C. React with RI
- D. Inter compound

**Answer: B**



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43. Chlorine can form substitution product with

- A. Propane
- B. Ethylene
- C. Benzene

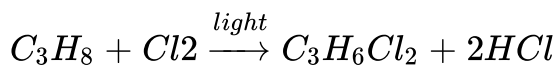
D. Both (a) and (c )

**Answer: D**



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**44.** The following reaction is an example of

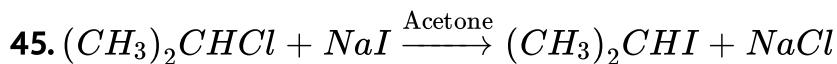


- A. Electrophilic addition reaction
- B. Free radical substitution reaction
- C. oxidation reaction
- D. Addition of halogen reaction

**Answer: B**



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The above reaction is known as :

- A. Perkin's reaction
- B. Finkelstein reaction
- C. Stephan's reaction
- D. Sabatier and sanderson's reaction

**Answer: B**



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46. Benzylidene chloride ( $C_6H_5Cl$ ) can be prepared from toluene by chlorination with

- A.  $PCl_5$
- B.  $SOCl_2$

C.  $Cl_2/h\nu$

D. NaOCl

**Answer: C**



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**47.** Chlorobenzene is prepared commercially by

A. Grignard's reaction

B. Wurtz-fitting reaction

C. Rasching process

D. Reimer-Tiemann reaction

**Answer: C**



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48. Sandmeyer's reaction of diazonium salts is a replacement reaction of  $N_2$  by

- A. Halides
- B. Hydroxyl group
- C. Hydrogen
- D. Azides

**Answer: A**



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49. Of the following alkyl halides, one with the lowest boiling point is

- A. Ethyl bromide
- B. Isopropyl bromide

C. n-butyl bromide

D. Methyl bromide

**Answer: D**



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**50. Which alkyl halide has maximum density ?**

A.  $C_3H_7I$

B.  $C_2H_5I$

C.  $CH_3Br$

D.  $CH_3I$

**Answer: D**



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51. Which of the following has the highest melting point ?

A. o-dichlorobenzene

B. p-dichlorobenzene

C. m-dichlorobenzene

D. chlorobenzene

**Answer: B**



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52. Acetonitrile is prepared by reacting an alcoholic solution of methyl iodide with

A. Silver cyanide

B. Potassium cyanide

C. Hydrogen cyanide

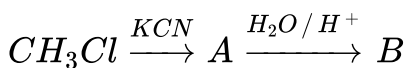
D. Ammonia

Answer: B



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53. The end product (B) in the following sequence of reactions is



A.  $CH_3COOH$

B.  $HCOOH$

C.  $CH_3NH_2$

D.  $CH_3COCH_3$

Answer: A



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54. The major product formed methyl iodide reacts with sodium nitrite is

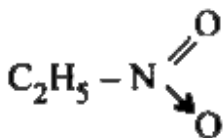
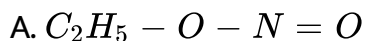
- A. Methyl nitrite
- B. Nitromethane
- C. Nitrous acid
- D. Nitroethane

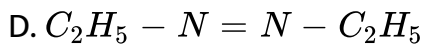
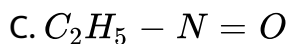
**Answer: A**



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55.  $C_2H_5I \xrightarrow{AgNO_2}$  X. Here X is :  
(major product)





**Answer: B**



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**56.** Alkyl halides react with an alcoholic solution of ammonia to give a mixture of

A. Primary and secondary amines

B. Primary and tertiary amines

C. Primary, secondary and tertiary amines

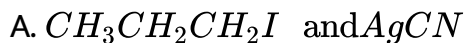
D. Primary, secondary, tertiary amines and the quaternary ammonium salts

**Answer: D**



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57. Isopropyl isocyanide can be obtained by the reaction between



Answer: B



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58. Grignard reagent is not prepared in aqueous medium but prepared in ether medium because



B. It is insoluble in water

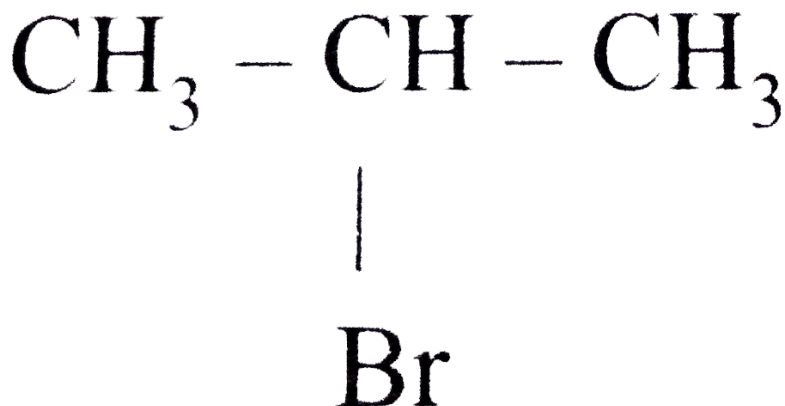
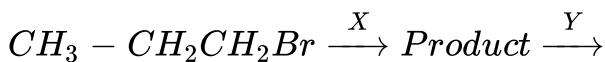
C. The reagent becomes inactive in water

D. The reagent reacts with water

**Answer: D**

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**59.** Identify the set of reagents / reaction conditions 'X' and 'Y' in the following set of transformations.



A. X=Dilute aqueous NaOH, Y=HBr

B. X=Alcoholic NaOH, Y=HBr

C. X=Dilute aqueous NaOH,  $Y = Br_2 / CHCl_3$

D. X=Alcoholic NaOH,  $Y = Br_2 / CHCl_3$

**Answer: B**



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**60.** An alkyl bromide produces a single alkene when it reacts with alcoholic KOH. This alkene on hydrogenation produces 2-methylbutane. Identify the alkyl halide

A. 1-Bromo-2, 2-dimethyl propane

B. 1-Bromobutane

C. 1-bromo-2-methylbutane

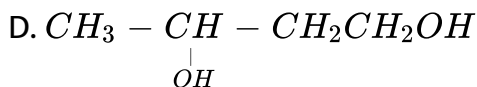
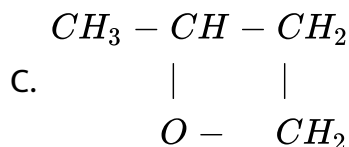
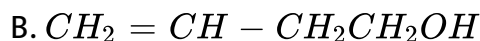
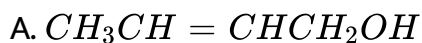
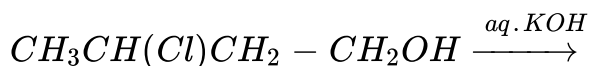
D. 2-bromo-2-methylpropane

Answer: C



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61. The major product formed in the following reaction

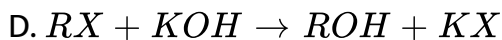
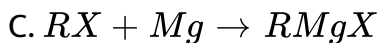
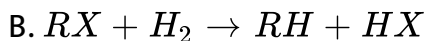
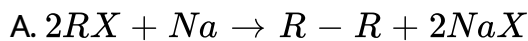


Answer: D



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62. Which of the following reactions is an example of nucleophilic substitution reaction?

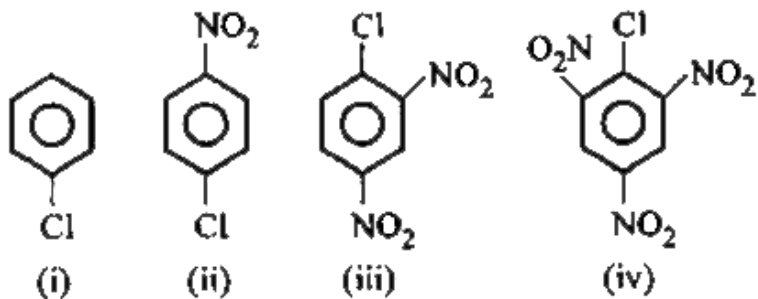


Answer: D



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63. Order of reactivity towards nucleophilic substitution reaction of the compounds



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

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

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

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

**Answer: C**

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**64.** Reaction of ethyl chloride with sodium leads to

A. Ethane



B. Propane

C. n-butane

D. n-pentane

**Answer: C**



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**65.** Which is not present in Grignard reagent

A. Methyl group

B. Magnesium

C. Halogen

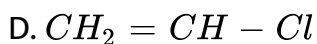
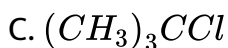
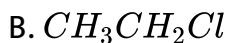
D.  $-COOH$  group

**Answer: D**



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66. Which chloride is least reactive with the hydrolysis point of view

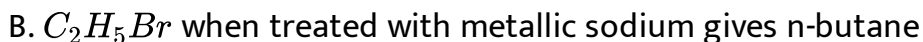


Answer: D



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67. Which of the following statements is incorrect ?



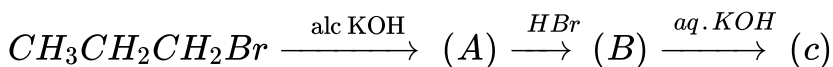
C.  $C_2H_5Br$  when treated with sodium ethoxide forms diethyl ether

D.  $C_2H_5Br$  with  $AgCN$  forms ethyl isocyanide

**Answer: A**

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**68.** Identify the final product ( C ) formed in the following sequence of reactions



A. propane-2-ol

B. Propan-1-ol

C. Propyne

D. Propene

**Answer: A**



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**69.** Methyl chloride reacts with silver acetate to yield

- A. Acetaldehyde
- B. Acetyl chloride
- C. Methyl acetate
- D. Acetic acid

**Answer: C**



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**70.** For a given alkyl group the densities of the halides follow the order

A.  $\text{RI} \ll \text{RBr} \ll \text{RCI}$

B.  $\text{RI} \ll \text{RCI} \ll \text{RBr}$

C.  $\text{RBr} \ll \text{RI} \ll \text{RCI}$

D.  $\text{RCI} \ll \text{RBr} \ll \text{RI}$

**Answer: D**



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**71.** Which of the following haloalkanes is most reactive?

A. 1-chloropropane

B. 1-bromopropane

C. 2-chloropropane

D. 2-bromopropane

**Answer: B**



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72. The hybridization state of carbon atoms in the product formed by the reactions of ethyl chloride with aqueous potassium hydroxide is .

A.  $sp$

B.  $sp^2$

C.  $sp^3$

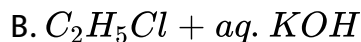
D.  $sp^3d$

Answer: C



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73. In which of the following reactions, the product is an ether ?

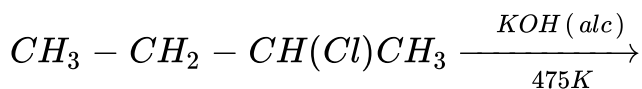


**Answer: D**



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**74.** For the reaction



A. A' Predominates

B. B' Predominates

C. Both A and B are formed in equal molar ratio

D. The product ratio depends upon the temperature

**Answer: B**



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75. p-Dichlorobenzene has higher m.p. than those of o- and m-isomers. Discuss

- A. p-Dichlorobenzene is more polar than o- and m-isomer
- B. p-Isomer has a symmetrical crystalline structure
- C. Boiling point of p-isomer is more than o- and m-isomer
- D. All the three are correct reasons

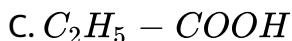
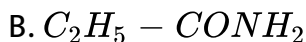
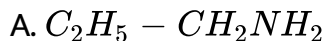
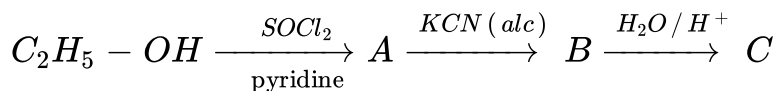
**Answer: B**



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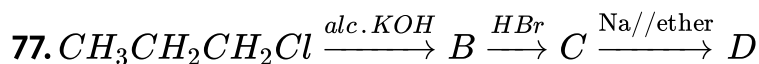
76. Identify the end product (C) in the following sequence :



Answer: C



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In the above reaction, the product D is

A. Propane

B. 2, 3-dimethylbutane

C. Hexane

D. Allyl bromide

**Answer: B**



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**78.**  $CH_3MgBr$  is an organometallic compound due to

A. Mg - Br bond

B. C- mg bond

C. C- Br bond

D. C - H bond

**Answer: B**



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79. Which of the following is an ambident nucleophile ?

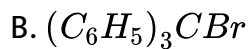
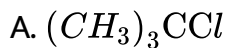


Answer: B



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80. Dehydrohalogenation is possible with



D. Both a and b

**Answer: A**



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**81.** An organic compound A reacts with  $PCl_5$  to give compound B. Compound B reacts with Na/ether to give n-butane. What are compounds A and B ?

A.  $C_2H_5OH$  and  $C_2H_5Cl$

B.  $C_2H_5Cl$  and  $C_2H_5ONa$

C.  $C_3H_7OH$  and  $C_3H_7Cl$

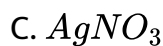
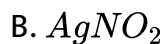
D.  $C_4H_9OH$  and  $C_4H_9Cl$

**Answer: A**



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82. Which one of the following reacts with haloalkane of form nitroalkane as a major product?

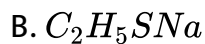
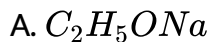


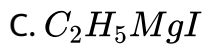
Answer: B



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83. Which one is an organometallic compound ?





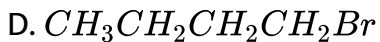
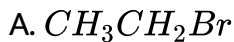
D. All of these

**Answer: C**



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**84.** Which alkyl halide has maximum reactivity ?



**Answer: B**



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85. the order of reactivity of alkyl halides depends upon:

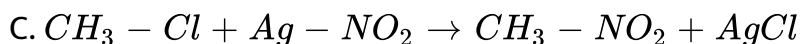
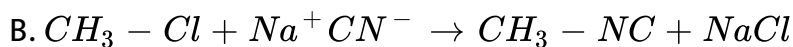
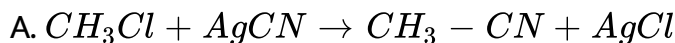
- A. Nature of alkyl group
- B. Nature of halogen atom
- C. Nature of both alkyl group and halogen atoms
- D. None of the above

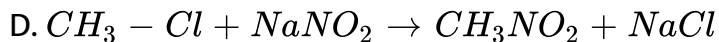
Answer: C



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86. Which of the following reaction products are correct



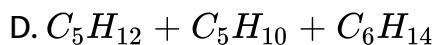
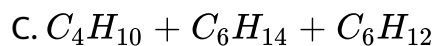
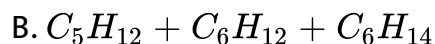
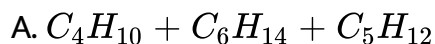


**Answer: C**



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87.  $C_2H_5I$  and  $C_3H_7I$  react with sodium metal and dry ether to give



**Answer: A**



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88. A compound is formed by the substitutio of two hydrogen atoms by two halogen atoms in propane. What is the number of structural isomers?

A. 4

B. 3

C. 2

D. 1

**Answer: A**



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89. When n-butyl magnesium iodide is treated with water the product obtained is

A. Isobutane

B. n-butane

C. Butene

D. Propane

**Answer: B**



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**90.** The strongest nucleophile among the following is

A.  $CN^-$

B.  $I^-$

C.  $CH_3COO^-$

D.  $NO_2^-$

**Answer: A**



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91. An organic halide with formula  $C_6H_{13}Br$  on heating with alc. KOH gives two isomeric alkene (A) and (B) with formula  $C_6H_{12}$ . On reductive ozonolysis of mixture (A) and (B), the following compounds are obtained :



The organic halide is :

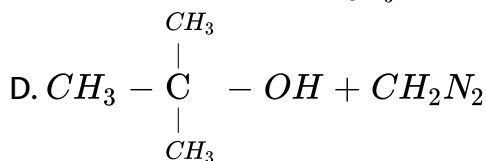
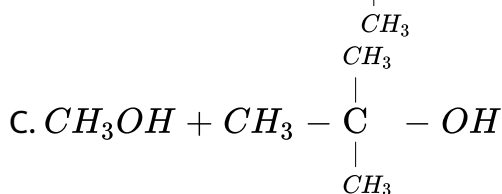
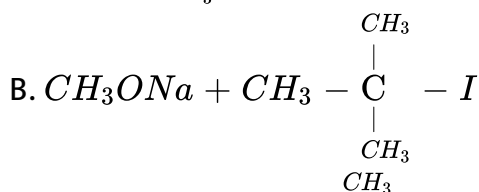
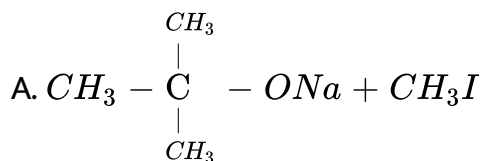
- A. 2-bromohexane
- B. 3-bromo-2-methyl pentane
- C. 2,2-dimethyl-1-bromohexane
- D. None of these

**Answer: B**



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92. Which of the following reactions would give the best yield of *t* – butyl methyl ether?



Answer: A



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93. 1-phenyl-2-chloropropane on treating with alc. *KOH* gives mainly

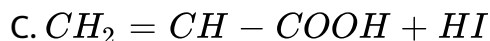
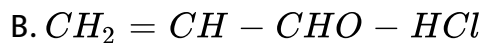
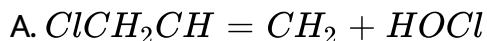
- A. 1-phenyl propene
- B. 3-phenyl propene
- C. 1-phenyl-2-propane
- D. 1-phenyl-3-propanol

**Answer: A**



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**94.** Anti markwnikoff's addition takes place in the reactions



D. All of the above

**Answer: D**



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95. HBr reacts fastest with

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

**Answer: A**



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96. During the reaction of 2 -bromopentane with sodium ethoxide the correct statement is

- A. Trans-2-pentene is the major product

- B. 1-pentene is the major product
- C. cis-2-pentene is not the major product
- D. All of the above

**Answer: D**



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**97.** For the preparation of ethyl propionate from ethyl bromide, the order reactnat can be

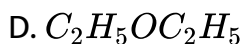
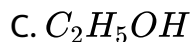
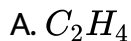
- A. Silver acetate
- B. Propionic anhydride
- C. Propanoyl chloride
- D. Silver propionate

**Answer: D**



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

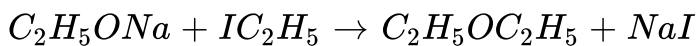


Answer: D



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99. The reaction given below is known as



A. Hoffmann reaction



- B. Williamsons synthesis
- C. Wurtz reaction
- D. Electrophilic substitution

**Answer: B**



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**100.** A mixture of 1 – chloropropane and 2 – chloropropane when treated with alcoholic  $KOH$ , it gives

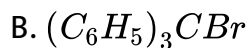
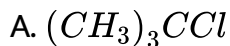
- A. Propene
- B. Propyne
- C. Isoprophylene
- D. None of these

**Answer: A**



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101. Dehydrohalogenation is possible with



D. Both a and b

Answer: A



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102. Stereoisomers which are not mirror image of each other, are called.:

A. Enantiomers

B. Diastereomers

C. Tuatomers

D. Geometrical isomers

**Answer: A**



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**103.** Optical isomerism is exhibited by

A. Primary butyl chloride

B. Secondary butyl chloride

C. Tertiary butyl chloride

D. Isobutyl chloride

**Answer: B**



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**104.** Which one of the following compounds can be optically active ?

- A. Propionic acid
- B. 2-chloropropanoic acid
- C. 3-chloropropanoic acid
- D. 3-chloropropanoic anhydride

**Answer: B**



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**105.** A mixture of equal parts of (+) and (-) enantiomers is called

- A. Homogeneous mixture
- B. Equilibrium mixture

C. Racemic mixture

D. Resonance hybrid

**Answer: C**



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**106.** Sec-butyl chloride obtained by free radical chlorination of n-butane is always

A. Dextrorotary

B. Laevorotatory

C. Racemic mixture

D. Can be leavo or dextro

**Answer: C**



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107.  $SN^1$  reactions occurs through the intermediate formation of

- A. Carbocations
- B. Carbanions
- C. Free radicals
- D. None of these

**Answer: A**



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108.  $S_N1$  reaction is favoured by

- A. Non-polar solvents
- B. Bulky groups on the carbon atom attached to the halogen atom

C. Small groups on carbon atom attached to the halogen atom

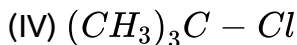
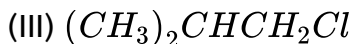
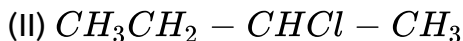
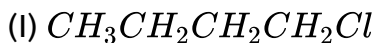
D. Strong nucleophile

**Answer: B**



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**109.** Arrange the following



in order of decreasing tendency towards  $SN^2$  reaction.

A. IgtIIgtIIgtIV

B. IIgtIVgtIIgtI

C. IIgtIgtIIgtIV

D. IVgtlllgtllgtl

**Answer: A**



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**110.** An  $SN^2$  reaction of an asymmetric carbon of a compound always gives :

- A. An enantiomer of the substance
- B. A product with opposite rotation
- C. A mixture of diastereomers
- D. A single isomer

**Answer: D**



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111. *R* and *S* pairs of enantiomers differ from one another in

- A. Their reactivity with achiral reagents
- B. Their optical rotation of plane polarized light
- C. Their melting points
- D. Their solubility in achiral reagents

**Answer: B**



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112. Isopropyl chloride undergoes hydrolysis by :

- A.  $SN^1$  mechanism
- B.  $SN^2$  mechanism
- C. Either  $SN^1$  or  $SN^2$  mechanism
- D. Neither  $SN^1$  nor  $SN^2$  mechanism

**Answer: C**



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**113.** The number of optical isomers formed by hydrogenation of the compound  $(CH_3)_2C = CHCH_3$  are

A. 1

B. 2

C. 3

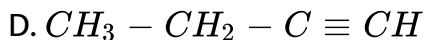
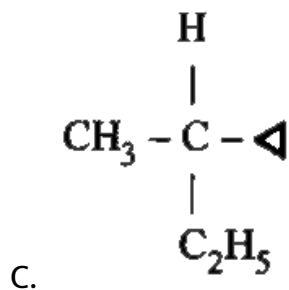
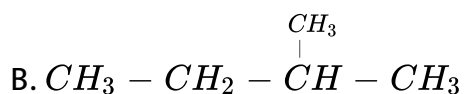
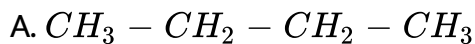
D. 0

**Answer: D**



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**114.** Amongst the following compounds, the optically active alkane having lowest molecular mass is



**Answer: C**



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**115.** Tertiary alkyl halide are practically inert to substitution by  $SN^2$  mechanism because of-

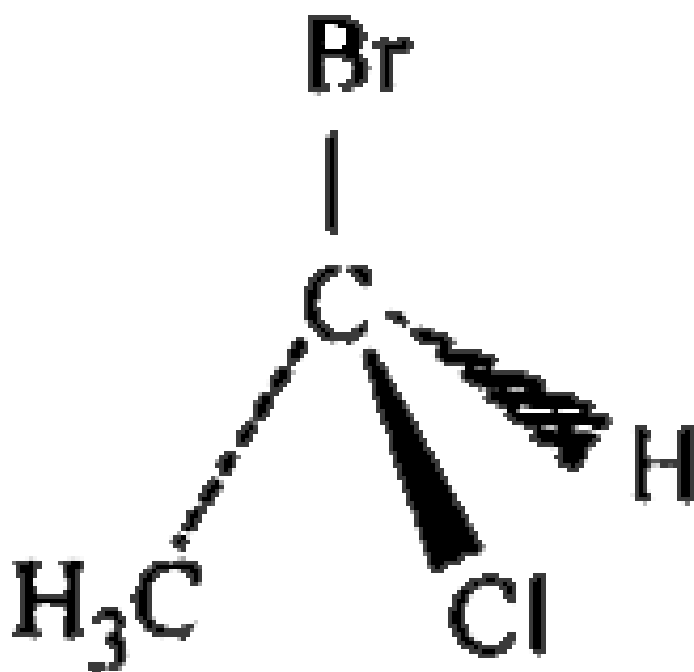
- A. Insolubility
- B. Instability
- C. Inductive effect
- D. Steric hindrance

**Answer: D**



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116. The chirality of the compound



A. d

B. R

C. S

D. 1

Answer: B



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117. The correct increasing order of the reactivity of halides for  $S_N 1$  reaction is :

A.



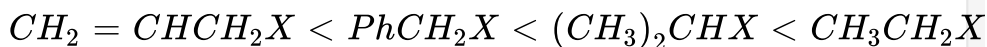
B.



C.



D.

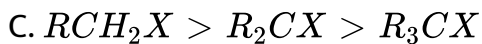
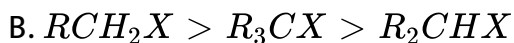
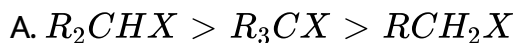


Answer: A



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118. Which of the following is the correct order of decreasing  $S_N2$  reactivity ?

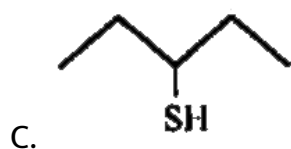
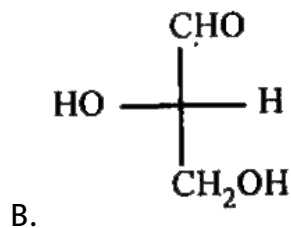
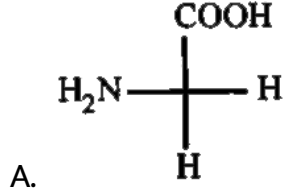


Answer: C



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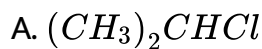
119. Which of the following molecules is expected to rotate the plane polarized light?



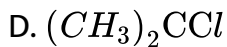
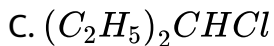
**Answer: B**

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**120.** The organic chloro compound, which shows complete stereochemical inversion during a  $S_N^2$  reaction, is:







**Answer: B**



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**121.** In nucleophilic aliphatic substitution, the nucleophiles are generally

A. Acids

B. Bases

C. Salts

D. Neutral molecules

**Answer: B**



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122.  $SN^1$  reaction of alkyl halides leads to

- A. Retention of configuration
- B. Racemisation
- C. Inversion of configuration
- D. Retention or inversion of configuration

**Answer: B**



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123. In their nucleophilic substitution reactions, aryl halide resembles

- A. Vinyl chloride

- B. Allyl chloride
- C. Benzyl chloride
- D. Ethyl chloride

**Answer: A**



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**124.** Backside displacement is observed in all  $SN^2$  reactions because

- A. Nucleophiles are electronically attracted the leaving groups
- B. Nucleophiles are electronically repelled the leaving groups
- C.  $SN^2$  reactions always take place through two steps
- D. Attack on a carbocation intermediate is favoured on the opposite side from which the leaving group departs

**Answer: B**



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**125.** Which of the following is the correct order of decreasing reactivity towards nucleophilic substitution ?

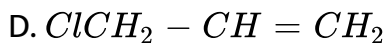
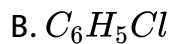
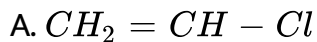
- A. Vinyl chloride gt Allyl chloride gt Propyl chloride
- B. Propyl chloride gt Vinyl chloride gt Allyl chloride
- C. Allyl chloride gt Vinyl chloride gt Propyl chlorine
- D. Allyl chloride gt Propyl chloride gt Vinyl chloride

**Answer: D**



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**126.** Which of the following is most reactive toward nucleophilic substitution reaction ?



**Answer: D**



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**127.** Racemic mixture is formed by mixing two:

A. Isomeric compound

B. Chiral compounds

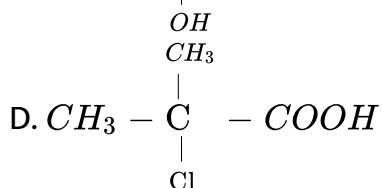
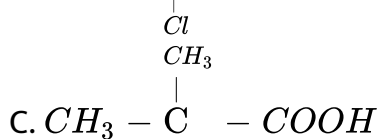
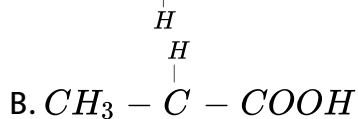
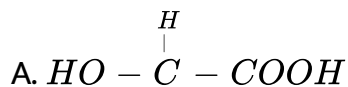
C. Meso compounds

D. Enantiomers with chiral carbon

**Answer: D**

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128. Which one of the following shows optical activity ?



Answer: B

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129. Lactice acid shows which types of isomerism

A. Geometrical isomerism

B. Tautomerism

C. Optical isomerism

D. Metamerism

**Answer: C**



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**130.** Separating of d and l enantiomers from a racemic mixture is called

A. Resolution

B. Dehydration

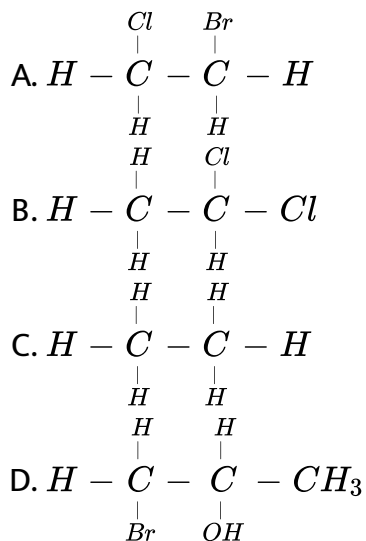
C. Rotation

D. Dehydrohalogenation

Answer: A

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131. Which of the following has/have asymmetric carbon atom?



Answer: D

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**132.** Rotation of plane polarized light is measured by

- A. Manometer
- B. Polarimeter
- C. Viscometer
- D. Refractometer

**Answer: B**



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**133.** Which of the following cannot be given to exemplify chiral structure ?

- A. A shoe
- B. A screw

C. A screw driver

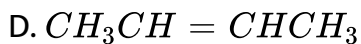
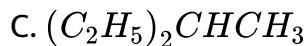
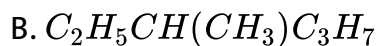
D. All of these

**Answer: D**



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**134.** Which of the following is expected to be optically active ?



**Answer: B**



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**135.** Which compound is optically active

A. 4-chloro, 1-hydroxybutane

B.  $3^\circ$  - Butyl alcohol

C. Secondary butyl amine

D. n-butyl alcohol

**Answer: C**



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**136.** Glucose has \_\_\_\_\_ optical isomers.

A. 8

B. 12

C. 16

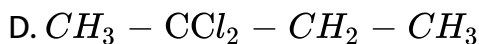
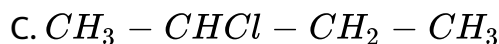
D. Cannot be predicted

**Answer: C**



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**137.** Which one of the following compound will show optical isomerism ?



**Answer: C**



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138. If a carbon atom is attached to -H, COOH and  $-OCOC_2H_5$  number of chiral C-atoms in compounds is

A. 1

B. 2

C. 3

D. 4

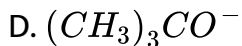
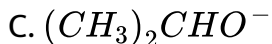
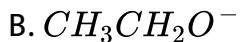
Answer: A



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139. Among the nucleophiles  $(CH_3)_3CO^-$ ,  $CH_3CH_2O^-$  and  $(CH_3)_2CHO^-$  the tendency to show  $SN^2$  reaction is maximum for

A.  $CH_3O$



**Answer: A**



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**140.** t-butyl chloride reacts with  $\text{OH}^-$  by  $\text{SN}^1$  mechanism with rate  $\propto [\text{tert. Butylchloride}]$ . One of the reason for the reaction to be first order is that

A. A stereochemical inversion takes place

B. The t-butyl carbocation is first formed which is more stable

C. The intermediate t-butyl carbocation is formed which is unstable

D. All of the above

**Answer: B**



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**141.** Select the correct statement among the following ?

A.  $SN^1$  reactions involve two steps

B.  $SN^2$  reactions involve two steps

C.  $SN^1$  reactions involves transition state intermediate

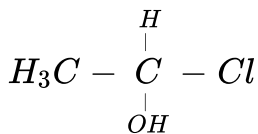
D.  $SN^2$  reaction involves carbonium ion intermediate

**Answer: A**



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142. For an organic compound



the correct statement is

- A.  $CH_3$  and Cl groups are coming out of the page
- B. H and OH groups are coming out of the page
- C.  $CH_3$  group is coming out while Cl group is going into the page
- D. All the above statements are incorrect

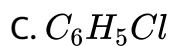
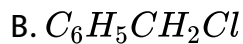
**Answer: A**



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143. The halide which will not react with benzene in presence of anhydrous  $AlCl_3$  is





**Answer: C**



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**144.** Which of the following is least reactive towards nucleophilic displacement reaction when treated with aqueous KOH ?

A. 2, 4, 6-Trinitrochlorobenzene

B. 2,4-Dinitrochlorobenzene

C. 4-Nitrochlorobenzene

D. 3-Nitrochlorobenzene

**Answer: D**



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**145.** Among the following which one has weakest carbon-halogen bond?

A. Benzyl bromide

B. Bromobenzene

C. Vinyl bromide

D. Benzyl chloride

**Answer: A**



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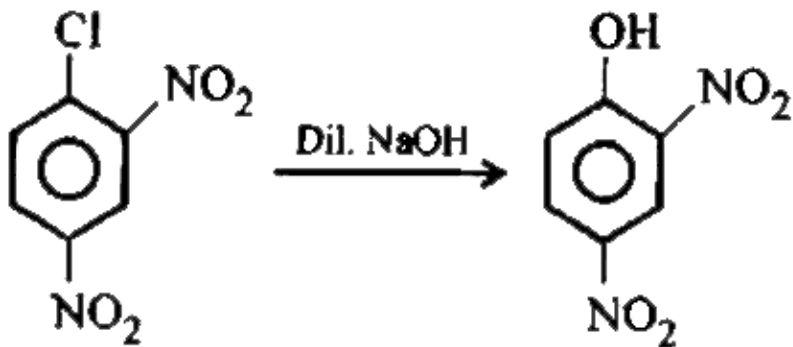
**146.** The reaction of 4-bromobenzyl chloride with NaCN in ethanol leads to :

- A. 4-Bromobenzyleyanide
- B. 4-Cyanobenzylchloride
- C. 4-Cyanobenzylcyanide
- D. 4-Bromo-2-cyanobenzylchloride

**Answer: A**



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147.

the above transformation proceeds through

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

**Answer: C**



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**148.** The set of compounds in which the reactivity of halogen atom in the ascending order is .

- A. Chlorobenzene, vinyl chloride, chloroethane
- B. Chloroethane, chlorobenzene , vinyl chloride
- C. Vinyl chloride, chlorobenzene, chloroethane
- D. Vinyl chloride, chloroethane, chlorobenzene

**Answer: A**



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**149.** Which represents nucleophilic aromatic substitution reaction ?

- A. Reaction of benzene with  $Cl_2$  in sunlight
- B. Benzyl bromide hydrolysis

C. Reaction of NaOH with dinitrofluorobenzene

D. Nitration of benzene

**Answer: C**



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**150.** Chlorobenzene is .

A. Less reactive than benzyl chloride

B. More reactive than ethyl bromide

C. Nearly as reactive as methyl chloride

D. More reactive than isopropyl chloride

**Answer: A**



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**151.** The reactivities of methyl chloride, propyl chloride and chlorobenzene are in the order

- A. Methyl chloride > Propyl chloride > Chlorobenzene
- B. Propyl chloride > Methyl chloride > Chlorobenzene
- C. Methyl chloride > Chlorobenzene > Propyl chloride
- D. Chlorobenzene > Propyl chloride > Methyl chloride

**Answer: A**

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**152.** Chlorobenzene on fusing with solid  $\text{NaOH}$  gives

- A. Benzene
- B. Benzoic acid
- C. Phenol

D. Benzene chloride

**Answer: C**



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**153.** Aryl halide is less reactive than halide towards nucleophilic substitution because

- A. Less stable carbonium ion
- B. Due to large C-Cl bond energy
- C. Inductive effect
- D. Resonance stabilization and  $sp^2$  hybridisation of C attached to halide

**Answer: D**



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**154.** The reaction of an aromatic halogen compound with an alkyl halide in presence of sodium and ether is called

- A. Wurtz reaction
- B. Sandmeyer's reaction
- C. Wurtz - fitting reaction
- D. Kolbe reaction

**Answer: C**

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**155.** When alkyl halides reaction with aromatic compounds in presence of anhydrous  $AlCl_3$ , the reaction is known as

- A. Friedal - craft reaction

B. Hofmann degradation

C. Kolbes synthesis

D. Beckmann rearrangement

**Answer: A**



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**156.** C-Cl bond of chlorobenzene in comparison to C-Cl bond of methyl chloride is

A. Longer and weaker

B. Shorter and weaker

C. Shorter and stronger

D. Longer and stronger

**Answer: C**



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**157.** Which attacking reagent is involved in friedal -craft alkylation of benzene ?

- A. Electrophile
- B. Nucleophile
- C. Free radicals
- D. Carbene

**Answer: A**



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**158.** Chlorobenzene is \_\_\_\_\_ reactive than benzene towards electrophilic substitution and directs the incoming electrophile to

the\_\_\_\_\_ position.

- A. More, ortho/para
- B. Less, ortho/para
- C. More, meta
- D. Less,meta

**Answer: B**



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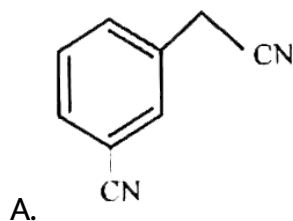
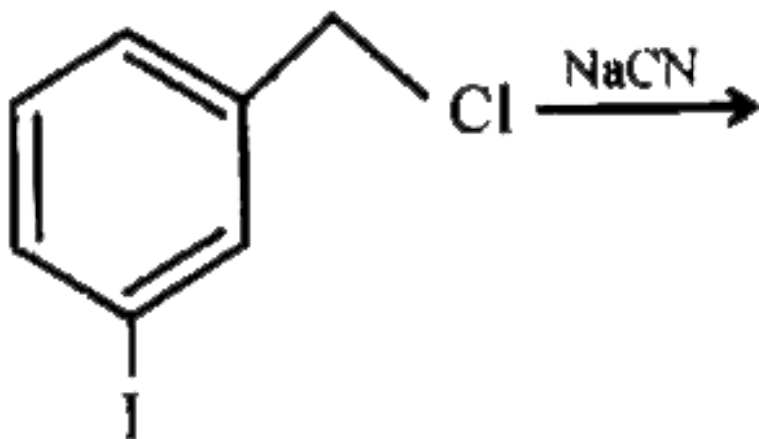
**159.** Fitting reaction can be used to prepare

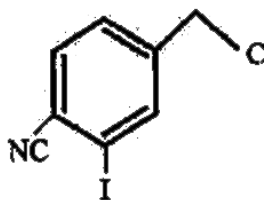
- A. Toluene
- B. Acetylphenone
- C. Diphenyl
- D. Chlorobenzene

Answer: C

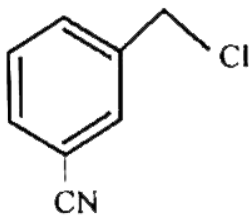
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160. The structure of the major product formed in the following reaction is

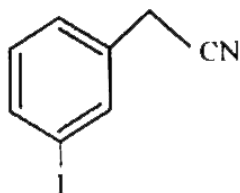




B.



C.



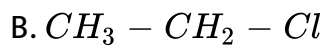
D.

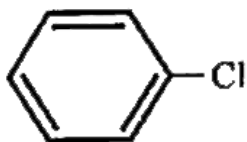
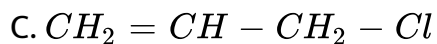
**Answer: D**



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**161.** In which of the following - Cl is not replaceable easily





D.

**Answer: D**

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**162.** Chlorination of chlorobenzene in presence of Fe gives

A. o-dichlorobenzene

B. m-dichlorobenzene

C. p-dichlorobenzene

D. o and p-dichlorobenzene

**Answer: D**

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**163.** Ethyl bromide (M) can be differentiated from bromobenzene (N) because with aqueous KOH solution

- A. M from alcohol easily
- B. N forms phenol easily
- C. M does not react
- D. N gives o-bromophenol

**Answer: A**



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**164.** X on treatment with sodium hydroxide followed by the addition of silver nitrate give white precipitate at room temperature which are soluble in  $NH_4OH$ . X can be :



A. Chloro benzene

B. Ethyl bromide

C. Benzyl chloride

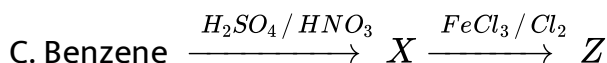
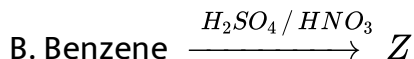
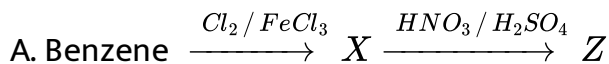
D. None of these

**Answer: C**



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**165.** Which of the following sequence would yield m-nitrochlorobenzene (Z) from benzene ?



D. All of these will produce Z

**Answer: C**



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**166.** An ethereal solution of 4-Nitrochlorobenzene is treated with metallic sodium. The product formed is :

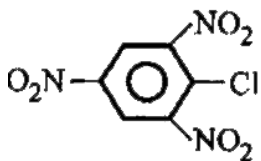
- A. Aminobenzene
- B. 4,4-dinitrodiphenyl
- C. p-chloroaniline
- D. None of these

**Answer: B**

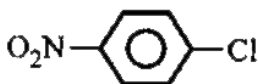


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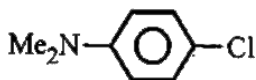
**167.** Which chloroderivative of benzene among the following would undergo hydrolysis most readily with aqueous sodium hydroxide to furnish the corresponding hydroxy derivative ?



A.



B.



C.

D.  $C_6H_5Cl$

**Answer: A**



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**168.** Chlorobenzene and benzyl chloride are distinguished by

A. Treatment with aqueous KOH and then  $AgNO_3$  solution

B. Lucas reagent

C. Decolourisation of  $Br_2$  in  $CCl_4$

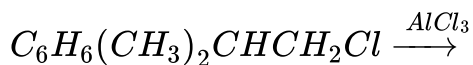
D. Orange red colour with  $CHCl_3 / AlCl_3$

**Answer: A**



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**169.** For the reaction



the final product is

A.  $C_6H_5CH_2CH(CH_3)_2$

B. Cumene

C. n-butyl benzene

D. None of these

**Answer: A**



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**170.** Aryl halides are less reactive than alkyl halides because of

- A. Longer bond length of C-X than alkyl halides
- B. Shorter bond length of C-X than alkyl halides
- C. Equal bond length of C - X as that of alkyl halides
- D. None of these

**Answer: B**



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**171.** The reaction of 4-bromobenzyl chloride with NaCl in ethanol forms

- A. 4-Bromobenzyl cyanide
- B. 4-Cyanobenzylchloride
- C. 4-Cyanobenzylcyanide
- D. 4-Bromo-2-cyanobenzylchloride

**Answer: A**



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**172.** Aryl halides are less reactive towards nucleophilic substitution reaction as compared to alkyl halides due to

- A. Of the formation of less stable carbonium ion
- B. C-X bond is longer

C. Of +1 effect on the ring

D. Of  $sp^2$  hybridised carbon and stabilisation of C-X bond by resonance

**Answer: D**



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**173.** Chlorobenzene reacts with Mg in dry ether to give a compound

A, which further reacts with ethanol to give

A. Phenol

B. Benzene

C. Ethyl benzene

D. Phenyl ether

**Answer: B**



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174. Chlorobenzene on treatment with acetyl chloride and anhydrous  $AlCl_3$  the major product formed will be

- A. o-Chloroacetophenone
- B. p-Chloroacetophenone
- C. o and p-Chloroacetophenone
- D. m-Chloroacetophenone

**Answer: B**



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175. Wurtz - fitting reaction involves the reaction of sodium metal with



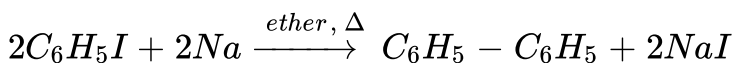
- A. Two molecules of an alkyl halide
- B. One molecule of an alkyl halide and one molecule of an aryl halide
- C. Two molecules of an aryl halide
- D. None of these

**Answer: B**



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**176.** The reaction



- A. Fitting reaction
- B. Wurtz-Fittig reaction
- C. Ullmann reaction

D. Wurtz reaction

**Answer: B**



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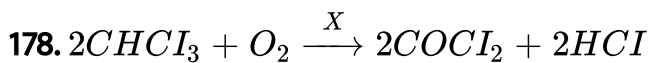
**177.** the chemical name of DDT is :

- A. 1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane
- B. 1,1-dichloro-2,2-diphenyltrimethylethane
- C. 1,1-dichloro-2,2-diphenyltrichloroethane
- D. 1,1,1-Trichloro-2,2-bis(m-chlorophenyl)ethane

**Answer: A**



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in the above reaction  $X$  stands for .

- A. An oxidant
- B. A reductant
- C. Light and air
- D. None of these

**Answer: C**



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179. Phosgene is the common name for

- A.  $CO_2$  and  $PH_3$
- B. Phosphoryl chloride

C. Carbonyl chloride

D. Carbon tetrachloride

**Answer: C**



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**180.** Depletion in ozone layer is caused by

A. Freon

B. Alkane

C. Grignard reagent

D. Chloroform

**Answer: A**



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**181.** Statement “Ozone in atmosphere is decreased by emission of chloro-fluoro-carbons like  $\text{CCl}_2\text{F}_2$ ”

- A. Is true
- B. Is false
- C. Only in presence of  $\text{CO}_2$
- D. Only in absence of  $\text{CO}_2$

**Answer: A**



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**182.** The formula of *DDT* is

- A. 5 chlorine atoms
- B. 4 chlorine atoms
- C. 3 chlorine atoms

D. 2 chlorine atoms

**Answer: A**



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**183.** Chloropicrin is used as

A. Solvent

B. Anaesthetic

C. perfume

D. Tear gas

**Answer: D**



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**184.** Freon (dichlorodifluoro methane) is used .

- A. As local anaesthetic
- B. For dissolving impurities in metallurgical process
- C. In refrigerator
- D. In printing industry

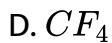
**Answer: C**



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**185.** Which of the following is known as freon which is used as a refrigerant ? .

- A.  $\text{CCl}_2\text{F}_2$
- B.  $\text{CHCl}_3$



**Answer: A**



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**186.** Which of the following is used in fire extinguishers ?



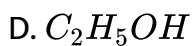
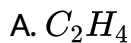
**Answer: D**



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**187.** Which of the following is an anaesthetic

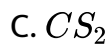


**Answer: B**



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**188.** The fire extinguisher 'pyrene' contains



D.  $\text{CHCl}_3$

**Answer: B**



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**189.** Iodoform is used as an:

A. Analgesic

B. Pain killer

C. Insecticide

D. Antiseptic

**Answer: D**



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190. the antiseptic action of  $CHI_3$  is due to :

- A. Iodoform itself
- B. Liberation of free iodine
- C. Partially due to iodine and partially due to  $CHI_3$  itself
- D. None of the above

Answer: B

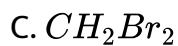


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191. A penta atomic organic compound has a molecular mass of 253.

The molecular formula of the compound is

- A.  $CHBr_3$
- B.  $CHI_3$



**Answer: A**



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**192.** The substance employed as a tear gas is

A. Westorn

B. Chloropicrin

C. Chloretone

D. None of these

**Answer: B**



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**193.** PVC is prepared by the polymerisation of

- A. Vinyl acetate
- B. Allyl chloride
- C. Vinyl chloride
- D. Ethylene

**Answer: C**



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**194.** Solvent used in dry cleaning of clothes is

- A. Alcohol
- B. Acetone
- C. Carbontetrachloride

D. Freon

**Answer: C**



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**195.** Pyrene (a fire extinguisher) is

A.  $CO_2$

B.  $CCl_4$

C.  $CS_2$

D.  $CHCl_3$

**Answer: B**



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196. Give the IUPAC name of :  $CH_3CH = C(Cl)CH_2CH(CH_3)_2$

A. 3-Chloro-5-methylhex-2-ene

B. 5-Chloro-3-methylhex-2-ene

C. 3-Chloro-2-methylhex-4-ene

D. 2-Chloro-3-methylhex-4-ene

Answer: A



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Higher Level

1. Give the IUPAC name of  $m - ClCH_2C_6H_4CH_2C(CH_3)_3$

A. 1-(3-chloro-3-methylphenyl)-2,2-diethylpropane

B. 2-(3-chloromethylpropyl)-2,2-dimethylpropane

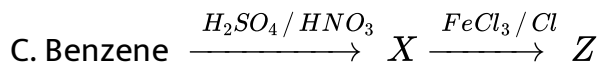
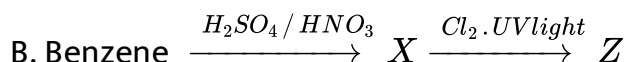
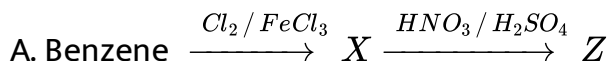
C. 1-(3-chloromethylpropyl)-3,3-dimethylpropane

D. 1-Chloromethyl-3-(2,2-dimethylpropyl)benzene

**Answer: D**

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2. Which of the following sequence would yield m-nitrochlorobenzene (Z) from benzene ?



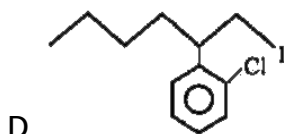
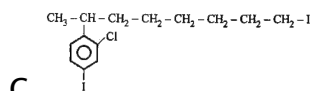
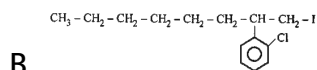
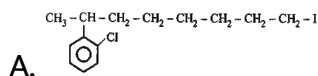
D. All of these will produce Z

**Answer: C**

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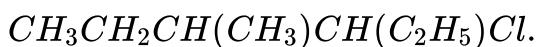
3. Give the structure of : 2-(2-chlorophenyl)-1-iodooctane



Answer: B

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4. The following structure has \_\_\_\_type of halide:



A.  $1^\circ$  Alkyl halide

B.  $2^\circ$  Alkyl halide

C. Benzylic  $2^\circ$  halide

D. Vinyl halide

**Answer: B**



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5.  $m - ClCH_2C_6H_4CH_2C(CH_3)_3$  is

A. Benzylic primary halide

B. Benzylic secondary halide

C. Benzyl tertiary halide

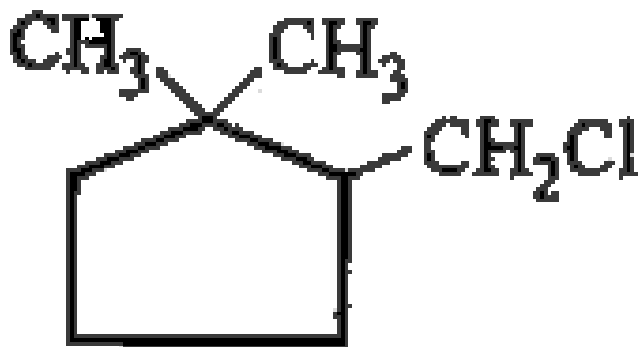
D. Aryl halide

**Answer: A**



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6. IUPAC name of following compound



- A. 1-Chloromethyl-2,2-dimethylcyclopentane
- B. 1-Chloromethyl-5,5-dimethylcyclopentane
- C. 2-Chloromethyl-1,1-dimethylcyclopentane
- D. 5-Chloromethyl-1,1-dimethylcyclopentane

**Answer: A**



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7. IUPAC name of following compound



- A. 4-bromo-3-methylpent-2-ene
- B. 3-bromo-4-methylpent-2-ene
- C. 4-bromo-2-methylpent-2-ene
- D. 4-bromo-3-methylpent-3-ene

**Answer: A**



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8. In  $\text{CH}_3\text{CH}_2\text{Br}$ , % of Br is

A. 80

B. 75

C. 70

D. 7

**Answer: B**



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**9.** A compound is formed by the substitution of two hydrogen atoms by two halogen atoms in propane. What is the number of structural isomers?

A. 4

B. 3

C. 2

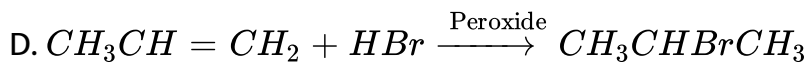
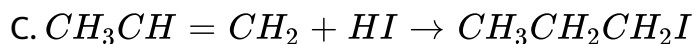
D. 1

Answer: A



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10. Pick out the correct equation

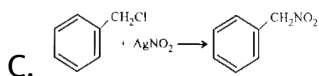
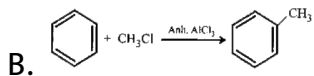
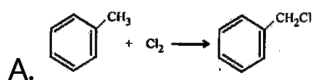


Answer: A



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11. Which of the following is a free radical substitution reaction



Answer: A



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12. What is the main product of the reaction between 2-methylpropene with HBr ?

A. 1-Bromobutane

B. 1-Bromo-2-methylpropane

C. 2-Bromobutane

D. 2-bromo-2-methylpropane

**Answer: D**



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**13.** Halogenation of alkanes is

A. A reductive process

B. An oxidative process

C. An isothermal process

D. An endothermal process

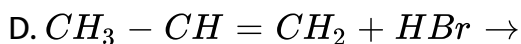
**Answer: B**



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14. Which of the following reactions will yield 2,2-dibromopropane



Answer: A



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15. The main product formed when ethylbenzene reacts with chlorine in presence of UV light is

A. 1-chloro-1-phenylethane

B. o-chloroethylbenzene

C. m-chloro-1-phenylethane

D. p-chloroethylbenzene

**Answer: A**



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16. The number of monochloro product obtained during the reaction of 2,3-dimethyl butane with  $Cl_2$  in presence of sunlight is :  
(do not consider optical isomers)

A. 2

B. 3

C. 4

D. 5

**Answer: A**



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17. In the reaction,  $A \xrightarrow{KCN} B \xrightarrow{[H]} C_2H_5NH_2$

A. A is  $CH_3I$

B. B is  $CH_3NC$

C. A is  $C_2H_5I$

D. B is  $C_2H_5NC$

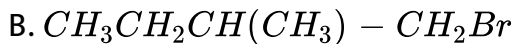
**Answer: A**



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18. Which of the following alkyl halide when subjected to dehydrohalogenation by the action of ethanolic KOH would yield  $CH_3CH = C(CH_3)_2$  as the major product ?

A.  $CH_3CHBr - CH(CH_3)_2$

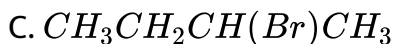
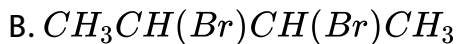
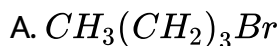


**Answer: A**



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**19.** An unknown alkyl halide A reacts with alcoholic KOH to produce a hydrocarbon ( $\text{C}_4\text{H}_8$ ). Ozonolysis of the hydrocarbon affords one mole of propionaldehyde and one mole of formaldehyde. Suggest which organic structure among the following is the correct structure of the above alkyl halide A ?





**Answer: A**



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**20.** Reaction of t-butyl bromide with alcoholic KOH products

A. Isobutane

B. Isobutylene

C. Sodium t-butoxide

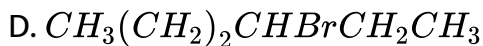
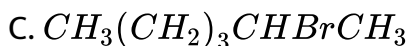
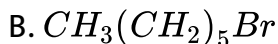
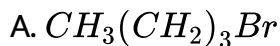
D. t-butylmethylether

**Answer: D**



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21. An alkyl bromide reacts with  $Na$  metal to form 4, 5-diethyl octane. The bromide is

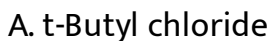


Answer: D



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22. An organic compound  $A(C_4H_6Cl)$  on reaction with  $Na$ /diethyl ether gives a hydrocarbon which on monochlorination gives only one chloro derivative  $A$  is .



B. Sec-butyl chloride

C. Isobutyl chloride

D. n-butyl chloride

**Answer: A**



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**23.** In order to prepare a pure sample of 2,3-dimethylbutene which of the following should be warmed with sodium in ether ?

A. Isopropyl bromide

B. Tertiary butyl bromide

C. Ethyl chloride

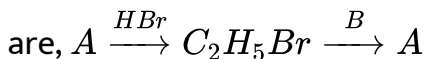
D. n-Propyl bromide

**Answer: A**



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24. In the following reaction, A and B respectively.



A.  $C_2H_4$  and alcoholic  $KOH / \Delta$

B.  $C_2H_5Cl$  and aq.  $KOH / \Delta$

C.  $C_2H_5OH$  and aq.  $KOH / \Delta$

D. Both (a) and (c)

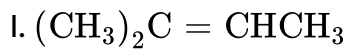
Answer: A



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25. When 2-chloro-2-methylbutane is heated with alc. KOH, the possible product(s) is/are





A. 1,2 and 3

B. 1 and 2

C. 1 and 3

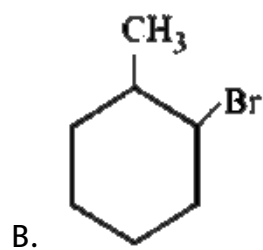
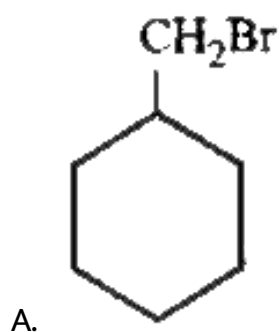
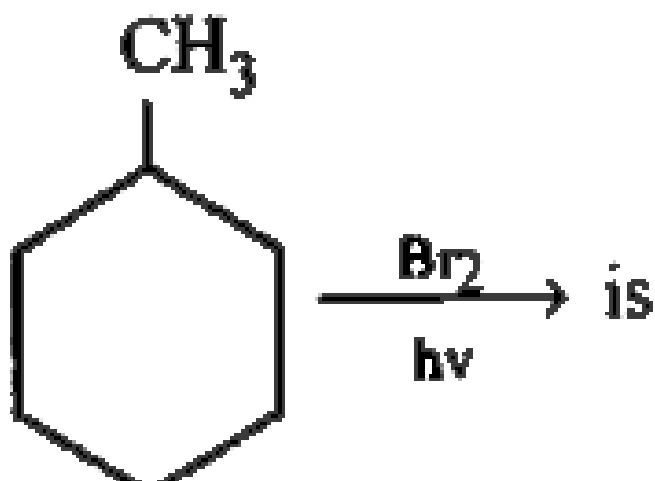
D. 2 and 3

**Answer: B**

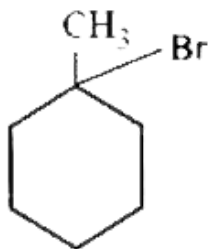


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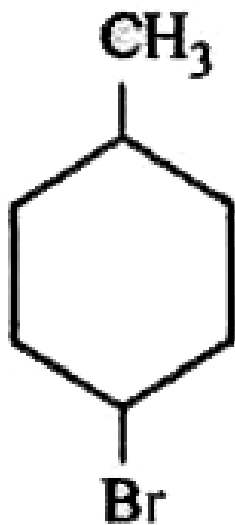
26. The major product obtained in the reaction ,



C.



D.

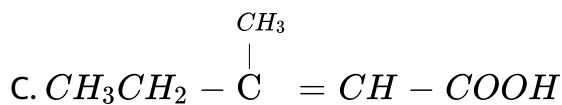
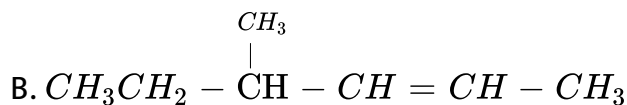
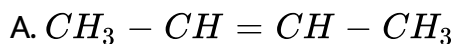


**Answer: C**



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**27.** Which of the following compounds can exhibit both geometrical isomerism and enantiomerism ?

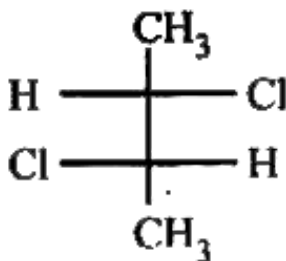
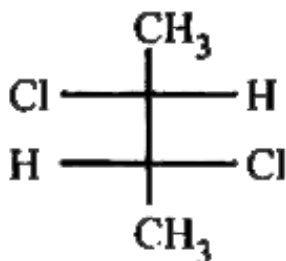


**Answer: B**



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**28.** If optical rotaion produced by compound (i) is  $+52^\circ$  than that produced by compound (ii) is



A.  $-52^\circ$

B.  $+52^\circ$

C.  $0^\circ$

D. Unpredictable

**Answer: A**



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**29.** When optically active halide is attacked by  $CN^-$ , the product obtained is a racemic mixture. Hence, the halide should be

A. Primary

B. Secondary

C. Tertiary

D. None of the above

**Answer: C**



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30. The increasing order of reactivity towards  $SN^2$  reactivity is

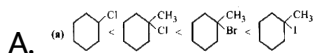


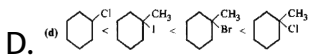
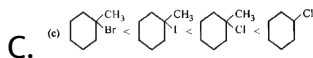
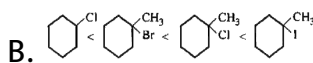
Answer: D



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31. Pick up the correct order of reactivity of the following compounds in  $SN^1$  reactions.

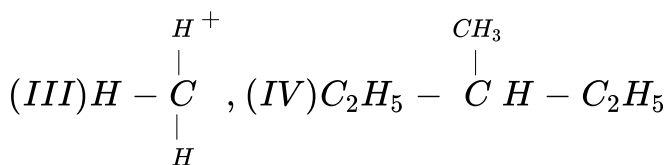
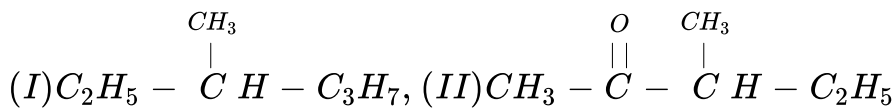




**Answer: A**

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**32.** Among the following structures *I* to *IV*, it is true that:



A. Only II and IV are chiral compounds

B. All four are chiral compounds

C. Only I and III are chiral compounds

D. Only III is a chiral compound

**Answer: C**



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**33.** How many enantiomeric pairs are obtained by monochlorination of 2,3-dimethylbutane

A. Nil

B. 4

C. 2

D. 1

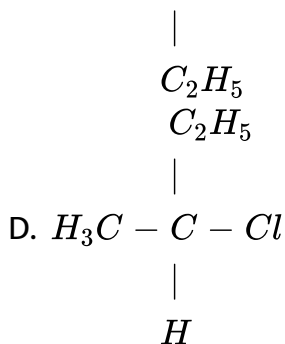
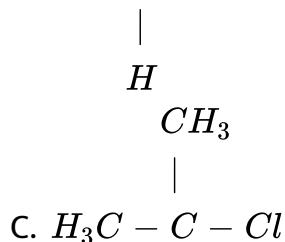
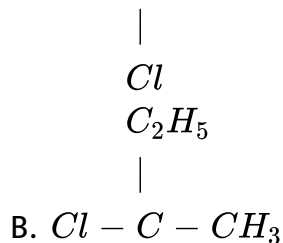
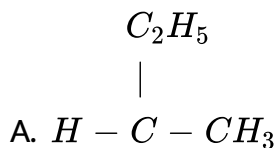
**Answer: D**



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34.  $CH_3 - CHCl - CH_2 - CH_3$  has a chiral centre. Which one of the following represents its s- configuration ?



Answer: D

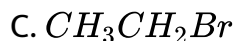
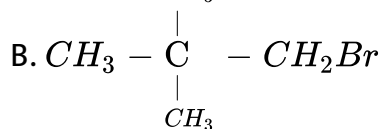
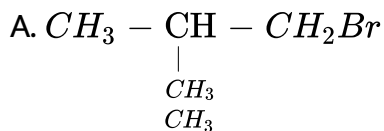


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35. In a  $S_N2$  substitution reaction of the type



which one of the following has the highest relative rate?

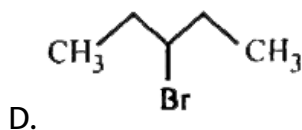
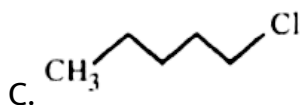
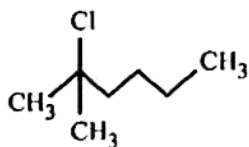
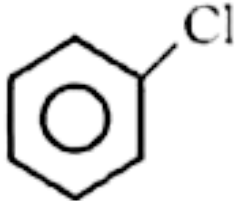


Answer: C



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36. Which of the following shows  $S_N1$  reaction most readily ?

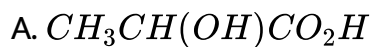


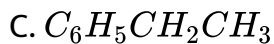
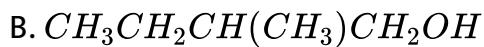
**Answer: B**



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**37.** Which of the following compounds may not exist as enantiomers?





**Answer: C**



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**38.** Number of optical isomers of lactic acid are

A. 1

B. 2

C. 3

D. 4

**Answer: B**



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39. The number of enantiomers of the compound

$CH_3CHBrCHBrCOOH$  is

A. 0

B. 1

C. 3

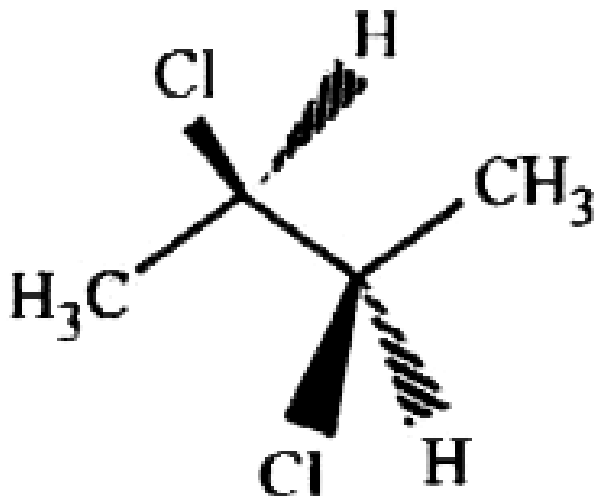
D. 4

**Answer: D**



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40. The correct statements about the compound given below is



- A. The compound is optically active
- B. The compound possesses centre of symmetry
- C. The compound possesses plane of symmetry
- D. The compound possesses axis of symmetry

**Answer: A**

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41. What is the possible number of optical isomers for a compound containing 2-dissimilar asymmetric carbon atoms?

A. 2

B. 4

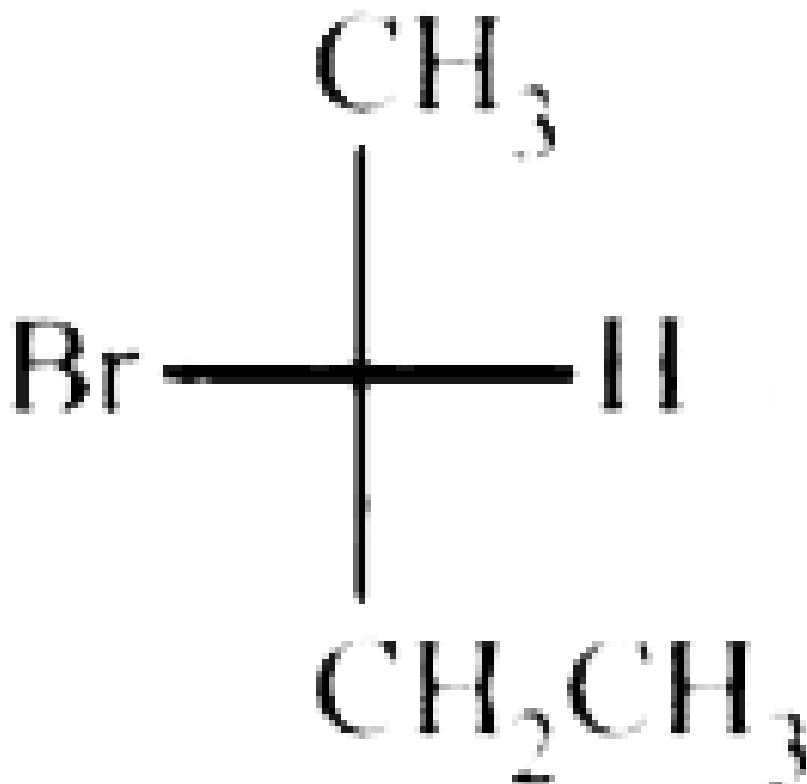
C. 6

D. 8

**Answer: B**



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42. When

reacts with KOH in presence of water (through  $SN^2$  reaction mechanism) then stereochemistry of product so formed will be

A. R

B. S

C. Mixture of R and S



D. partial S+ Racemic mixture

Answer: A



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43. Which of the following combinations is correctly matched?

- |    | compound   | Reaction | Stereochemistry            |
|----|--|----------|----------------------------|
| A. | $\begin{array}{c} H \\   \\ CH_3 - C - Cl \\   \\ D \end{array}$           | $SN^2$   | Walden inversion           |
|    | compound   | Reaction | Stereochemistry            |
| B. | $\begin{array}{c} H \\   \\ CH_3 - C - Cl \\   \\ D \end{array}$           | $SN^2$   | Walden retention           |
|    | compound   | Reaction | Stereochemistry            |
| C. | $\begin{array}{c} C_2H_5 \\   \\ C_6H_5 - C - Cl \\   \\ CH_3 \end{array}$ | $SN^1$   | Retention in configuration |
|    | compound   | Reaction | Stereochemistry            |
| D. | $\begin{array}{c} C_2H_5 \\   \\ C_6H_5 - C - Cl \\   \\ CH_3 \end{array}$ | $SN^1$   | inversion in configuration |

**Answer: A**



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**44.** Benzene reacts with acetyl chloride in the presence of anhydrous  $AlCl_3$  to give

- A. o-Chloroacetophenone
- B. p-Chloroacetophenone
- C. o and p-Chloroacetophenone
- D. m-Chloroacetophenone

**Answer: C**



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45. The reactivity of the compounds

(i) MeBr

(ii)  $PhCH_2Br$

(iii) MeCl

(iv)  $p - MeOC_6H_4 Br$  decreases as

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

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

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

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

Answer: D



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46. Replacement of  $Cl$  of chlorobenzene to give pheno1 require drastic conditions but chlorine of 2,4-dinitrochlorobenzene is

readily replaced because .

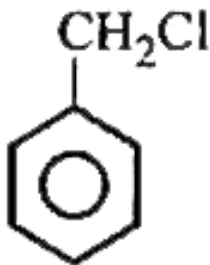
- A.  $\text{NO}_2$  makes the ring electron rich at ortho and para positions
- B.  $\text{NO}_2$  withdraws  $e^-$  from meta - positions
- C.  $\text{NO}_2$  donates  $e^-$  at m-position
- D.  $\text{NO}_2$  withdraws  $e^-$  from ortho/para-position

**Answer: D**

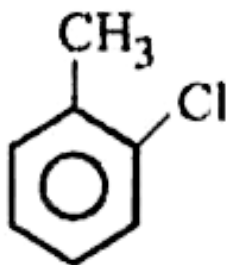


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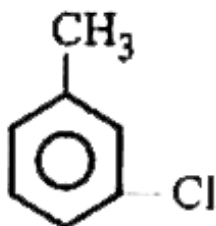
47. Out of the various possible isomers of  $\text{C}_7\text{H}_7\text{Cl}$  containing a benzene ring, the weakest C-Cl bond is present in



A.



B.



C.



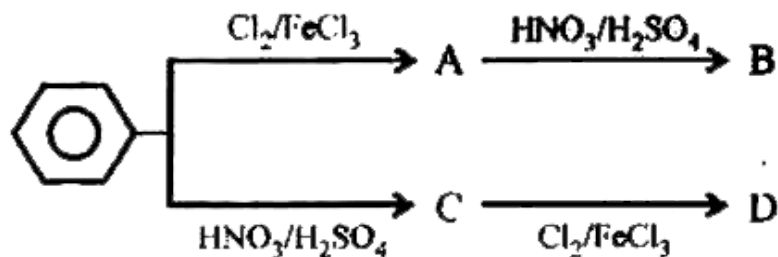
D.

Answer: A

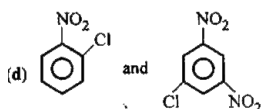
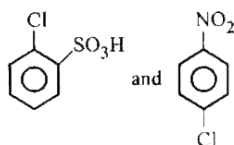
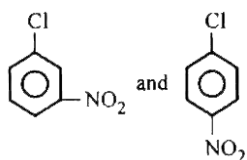
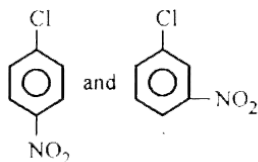


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48. Consider the following reaction sequence



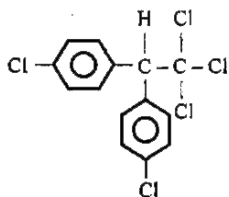
In this B and D respectively are



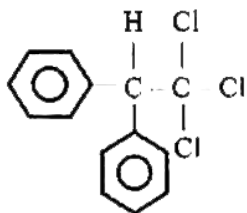
Answer: A

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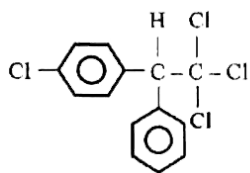
49. Which one of the following is the correct formula of dichlorodiphenyl trichloroethane ? .



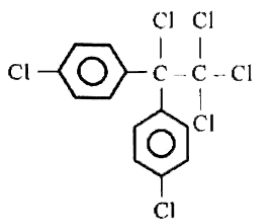
A.



B.



C.



**Answer: A**

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**50.**  $CH_3MgBr$  is an organometallic compound due to

- A. Mg-Br bond
- B. C-Mg bond
- C. C- Br bond
- D. C-H bond

**Answer: B**

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51. A similarity between optical and geometrical isomerism is that

- A. Each forms equal number of isomers for a given compound
- B. If in a compound one is present then so is the other
- C. Both are included in stereoisomerism
- D. They have no similarity

Answer: C



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52. Bottles containing  $C_6H_5I$  and  $C_6H_5 - CH_2I$  lost their original labels. They were labelled A and B for testing. A and B were separately taken in a test tube and boiled with  $NaOH$  solution. The end solution in each tube was made acidic with dilute  $HNO_3$  and then some  $AgNO_3$  solution was added. Substance B gave a yellow

precipitate. Which one of the following statements is true for this experiment.

A. A and  $C_6H_5CH_2I$

B. B and  $C_6H_5I$

C. Addition of  $HNO_3$  was unnecessary

D. A and  $C_6H_5I$

**Answer: D**



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**53.** Of the five isomeric hexanes, the isomer which can give two monochlorinated compounds is

A. n-hexane

B. 2,3-dimethylbutane

C. 2,2-dimethylbutane

D. 2-dimethylbutane

**Answer: B**



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**54.** Which type of isomerism is shown by 2, 3-Dichlorobutane ?

A. Diastereo

B. Optical

C. Geometric

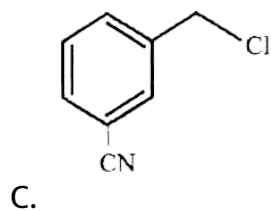
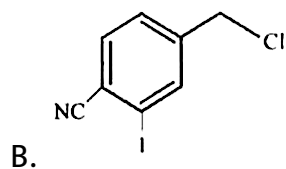
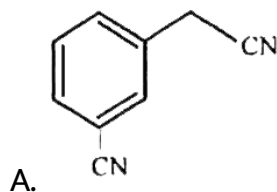
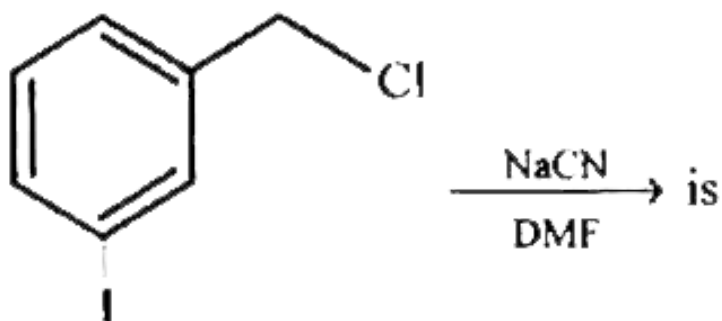
D. Structure

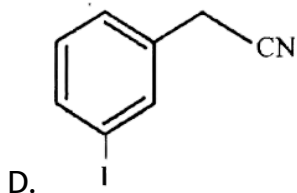
**Answer: B**



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55. The structure of the major product formed in the following reaction is





**Answer: D**

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56. Trans - 2 phenyl 1 - bromocyclopenta ne on reaction with alcoholic KOH produces

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

**Answer: D**

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57. Which one of the following conformations of cyclohexane is chiral?

A. Twist boat

B. Rigid

C. Chair

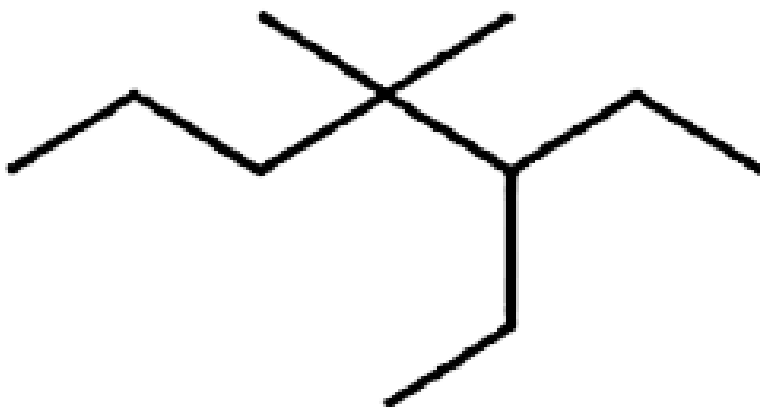
D. Boat

**Answer: A**



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58. The IUPAC name of



is

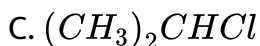
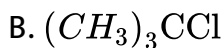
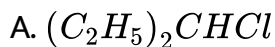
- A. 1,1-diethyl-2,2-dimethylpentane
- B. 4,4-dimethyl-5,5-diethylpentane s
- C. 5,5-diethyl-4,4-dimethylpentane
- D. 3-ethyl-4,4-dimethylheptane

**Answer: D**



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59. The organic chloro compound, which shows complete stereochemical inversion during a  $S_N^2$  reaction, is:



**Answer: D**



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60. Toluene is nitrated and the resulting product is reduced with tin and hydrochloric acid. The product so obtained is diazotised and then heated with cuprous bromide. The reaction mixture so formed contains



- A. Mixture of o and p-bromotoluenes
- B. Mixture of o and p-dibromobenzenes
- C. Mixture of o and p - bromoanilines
- D. Mixture of o and m-bromotoluenes

**Answer: A**



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**61.** The correct decreasing order of priority for the functional groups of organic compounds in the IUPAC system of nomenclature is

- A.  $-COOH$ ,  $-SO_3H$ ,  $-CONH_2$ ,  $-CHO$
- B.  $-SO_3H$ ,  $-COOH$ ,  $-CONH_2$ ,  $-CHO$
- C.  $-CHO$ ,  $-COOH$ ,  $-SO_3H$ ,  $-CONH_2$

D.  $CONH_2$ ,  $-CHO$ ,  $-SO_3H$ ,  $-COOH$

**Answer: B**



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**62.** Out of the following the alkene that exhibits optical isomerism is

A. 3-methyl-2-pentene

B. 4-methyl-1-pentene

C. 3-methyl-1-pentene

D. 2-methyl-2-pentene

**Answer: C**



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63. How many chiral compounds are possible on monochlorination of 2-methyl butane

A. 8

B. 2

C. 4

D. 6

**Answer: B**



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64. The reaction of toluene with chlorine in the presence of ferric chloride gives mainly

A. Benzoyl chloride

B. m-chlorotoluene

C. Benzyl chloride

D. o and p-chlorotoluene

**Answer: D**



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**65.** The number of structural and configurational isomers of a bromo compound,  $C_5H_9Br$ , formed by the addition of  $HBr$  to 2-pentyne respectively, is:

A. 1 and 2

B. 2 and 4

C. 4 and 2

D. 2 and 1

**Answer: B**



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66. The number of possible enantiomer pairs that can be produced during monochlorination of 2-methylbutane is :

A. 2

B. 3

C. 4

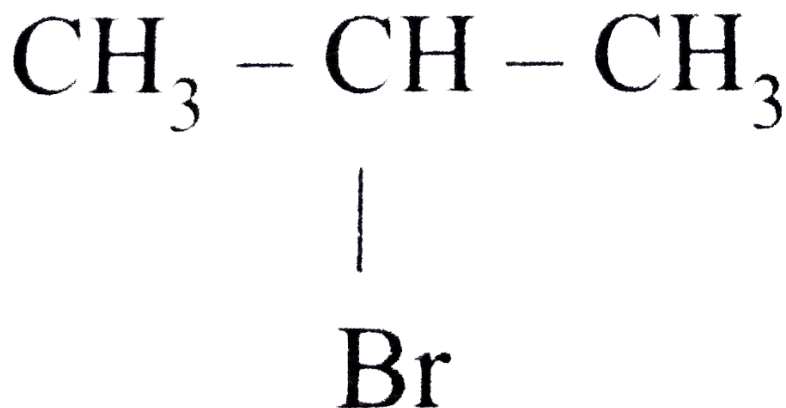
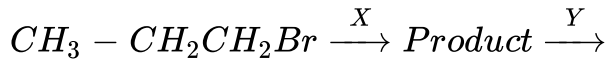
D. 1

**Answer: A**



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67. Identify the set of reagents / reaction conditions 'X' and 'Y' in the following set of transformations.



A. X=Dilute aqueous NaOH,  $20^\circ C$  ,

Y=HBr/acetic acid  $20^\circ C$

B. X=concentrated alcoholic NaOH,  $80^\circ C$  ,

Y=HBr/acetic acid ,  $20^\circ C$

C. X=dilute aqueous NaOH,  $20^\circ C$  ,

Y= $Br_2 / CHCl_3$ ,  $0^\circ C$

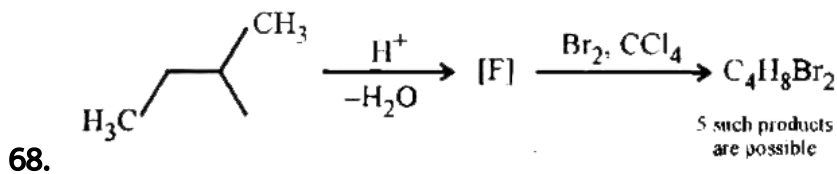
D. X=concentrated alocoholic NaOH ,  $80^\circ C$  ,

$Y = Br_2 / CHCl_3$ ,  $0^\circ C$

**Answer: B**



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How many structure of F are possible ?

A. 2

B. 5

C. 6

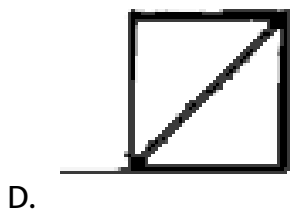
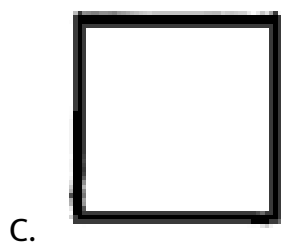
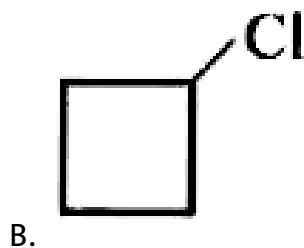
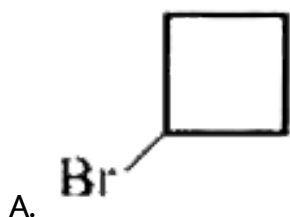
D. 3

Answer: D



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69. What would be the product formed when 1-bromo-3-chlorocyclobutane reacts with two equivalents of metallic sodium in ether ? .





**Answer: D**



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## Previous Years Entrance Exams Mcq

1.  $SN^2$  is favoured by

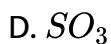
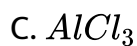
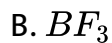
- A. Polar solvent
- B. non polar solvent
- C. More branching
- D. Weak nucleophile

**Answer: B**



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2. Which is not electrophile ?



**Answer: A**



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3. Ethylidene dichloride is obtained by the reaction of excess of HCl with

A. Ethylene

B. Acetylene

C. Acetaldehyde

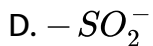
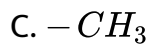
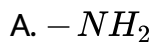
D. Ethylene glycol

**Answer: B**



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**4. Negative inductive effect is shown by**



**Answer: A**



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5. Chloroform on reduction with zinc and water gives:

A. Methylene dichloride

B. Methane

C. Formic acid

D. Carbon tetrachloride

**Answer: C**



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6.  $C_3H_6Cl_2$  has how many isomers which are vicinal dihalide ?

A. 1

B. 2

C. 3

D. 4

**Answer: A**



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7. Chlorine ( $Cl^{17}$ ) free radical contains how many electrons around the nucleus ?

A. 7

B. 10

C. 17

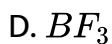
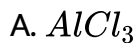
D. 16

**Answer: C**



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8. Which among following is nucleophile ?



**Answer: B**



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9. Reaction of alkyl halides with ethanolic KOH is known as

A. Dehydration

B. Dehydrogenation

C. Dehydrohalogenation

D. Hydrolysis

**Answer: C**



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**10.** Which has maximum tendency to form racemate on alkaline hydrolysis ?

A. 1-bromo-1-phenyl ethane

B. n-propyl chloride

C. Isopropyl chloride

D. Neo pentyl bromide

**Answer: A**



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11. Which of the following on controlled chlorination will not give different isomer of monochloride derivative ?

A. Iso-butane

B. 2,2-Dimethylpropane

C. 2-Methylpentane

D. Propane

Answer: B



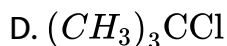
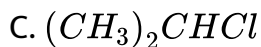
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12. Which of the following compounds most readily undergoes solvolysis by  $S_N1$  mechanism-

A.  $CH_3CH_2CH_2Cl$

B.  $CH_3Cl$





**Answer: D**



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**13.** A chloro derivative (A) on treatment with zinc - copper couple gives a hydrocarbon with five C atoms. When 'A' is dissolved in ether and treated with sodium, 2,2,5,5-tetramethyl hexane is obtained. What is the original compound 'A' ?

A. 3-chloro-2,2-dimethyl propane

B. 1-chloropropane

C. 1-chloro-2,2-dimethyl propane

D. 2-chloro-2-methyl butane

Answer: C



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14. Some statements are given below :

(A) In alkyl carbonium ions,  $C^+$  is  $sp^2$  hybridized

(B) Decreasing order of stability of carbocation is  $t > s > p$

(C) The central carbon atom has an open sextet of electrons

Among the above, true statements is / are :

A. A,B

B. B,C

C. A,C

D. All of these

Answer: D



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15.  $S_N2$  mechanism proceeds through formation of :

- A. Free radical
- B. Transition state
- C. Carbonium ion
- D. Carbanion

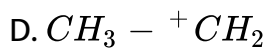
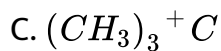
Answer: B



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16. The most stable carbonium ion is,

- A.  $^+CH_3$
- B.  $(CH_3)_2CH^+$



**Answer: A**



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17. Only two isomeric monochloro derivatives are possible for

A. n-pentane

B. 2,4-dimethyl pentane

C. Benzene

D. 2-methyl propane

**Answer: D**



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18. In the addition of  $HBr$  to propene in the absence of peroxides, the first step involves the addition of-

A.  $Br$

B.  $H$

C.  $Br^-$

D.  $H^+$

**Answer: D**



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19. If 'n' represents total number of asymmetric carbon atoms in a compound, then the possible number of optical isomers of the compound is

A.  $2n$

B.  $n^2$

C.  $2^n$

D.  $2n + 2$

**Answer: C**



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**20.** The compound which is not formed when a mixture of n-butyl bromide and ethyl bromide treated with sodium metal in the presence of dry ether is

A. Butane

B. Octane

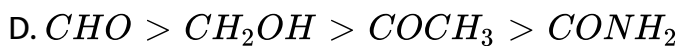
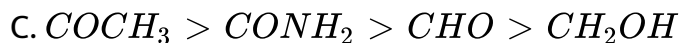
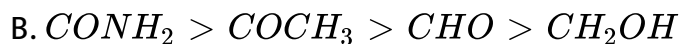
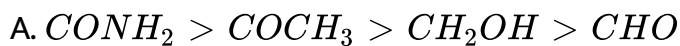
C. Hexane

D. Ethane

Answer: D

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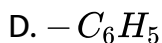
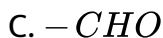
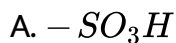
21. While assigning R,S configuration the correct order of priority of groups attached to chiral carbon atom is



Answer: B

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22. In assigning R-S configuration , which among the following groups has highest priority ?



**Answer: A**



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23. The conversion of ethyl bromide using sodium iodide and dry acetone, this reaction is known as

A. Swartz reaction

B. Finkelstein reaction



C. Sandmeyer reaction

D. Stephen reaction

**Answer: B**



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### Test Your Grasp

1. Give the IUPAC name of :  $CH_3C(Cl)(C_2H_5)CH_2CH_3$

A. 3-chloro-3-methylbutane

B. 3-chloro-3-methylpentane

C. 2-chloro-2-ethylbutane

D. 2-chloro-2-ethylpentane

**Answer:**



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2. Give the IUPAC name of :  $(CH_3)_3CCH = C(Cl)C_6H_4I - p$

- A. 3,3Dimethyl-1-chloro-4-(1-iodophenyl)but-1-ene
- B. 1-Bromo-3,3-dimethyl-1-(4-iodophenyl)but-2-ene
- C. 1-chloro-3,3-dimethyl-1-(4-iodophenyl)but-2-ene
- D. 1-Chloro-1-(4-iodophenyl)-3,3-dimethylbut-1-ene

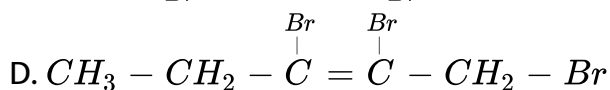
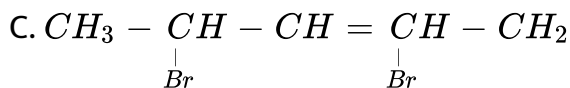
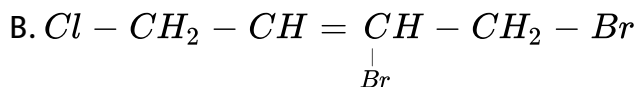
Answer:



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3. Give the structure of : 1,4-Dibromo-but-2-ene

- A.  $Br - CH_2 - CH = CH - CH_2 - Br$



**Answer:**



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4. The following structure has \_\_\_\_ type of halide : 2-Bromo-2-methylpentane

A.  $1^\circ$  Alkyl halide

B.  $2^\circ$  Alkyl halide

C.  $3^\circ$  Alkyl halide

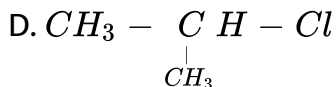
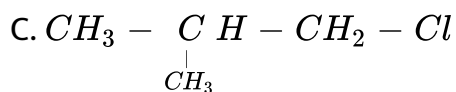
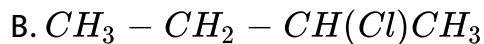
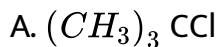
D. Vinyl halide

Answer:



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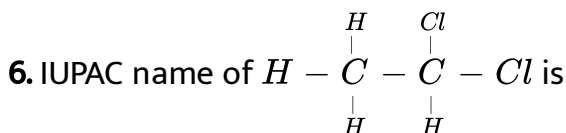
5. Which of the following is a primary alkyl halide ?



Answer:



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A. 1,2-Dichloroethane

B. 2,2-dichloroethane

C. 1,1-dichloroethane

D. dichloroethane

**Answer:**



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7. Chlorobenzene can be prepared by reacting aniline with

A. HCl

B.  $Cu_2Cl_2$

C.  $Cl_2$  in presence of anhydrous  $AlCl_3$

D.  $NaNO_2 + HX$  and then heated with  $CuCl_2$

**Answer:**



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8. In the preparation of chlorobenzene from aniline, the most suitable reagent is

- A. Chlorine in the presence of ultraviolet light
- B. Chlorine in the presence of  $AlCl_3$
- C. Nitrous acid followed by heating with  $Cu_2Cl_2$
- D. HCl and  $Cu_2Cl_2$

**Answer:**



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9. When thionyl chloride acts on ethyl alcohol, which of the following are also formed along with ethyl chloride?

A.  $S, SO_2$

B.  $SO_2, HCl$

C.  $Cl_2, SO_2$

D.  $C_2H_6$

**Answer:**



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**10.** The product formed in the reaction of  $HX$  with  $(CH_3)_2C = CH_2$  is

A.  $(CH_3)_2CXXH_3$

B.  $(CH_3)_2CH - CH_2X$

C.  $(CH_3)_2CH = CH_2$

D.  $(CH_3)_2CXCH_2X$

**Answer:**

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**11.** Reactivity order of halides of dehydrohalogenation is

A.  $R - F \text{ gt } R - Cl \text{ gt } R - Br \text{ gt } R - I$

B.  $R - I \text{ gt } R - Br \text{ gt } R - Cl \text{ gt } R - F$

C.  $R - I \text{ gt } R - Cl \text{ gt } R - Br \text{ gt } R - F$

D.  $R - F \text{ gt } R - I \text{ gt } R - Br \text{ gt } R - Cl$

**Answer:**

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**12.** Vinyl chloride  $\xrightarrow{HCl}$



- A. 1,1 - dichloroethane
- B. 1,2-dichloroethane
- C. Tetrachloroethylene
- D. Mixture of 1,2 and 1,1 - dichloroethane

**Answer:**



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**13.** Propadiene is obtained when alcoholic caustic potash reacts with

- A. Ethyl chloride
- B. Propyl chloride
- C. Allyl chloride
- D. Isobutyl chloride

**Answer:**



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14. Elimination of bromine from 2 – bromobutane results in the formation of

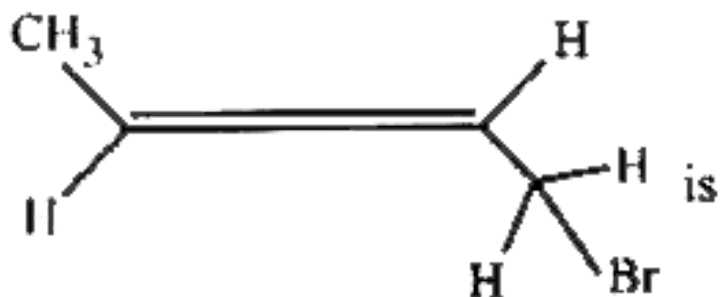
- A. Equimolar mixture of But-ene and But-2-ene
- B. Predominantly But -2-ene
- C. Predominantly But-1-ene
- D. Predominantly But-2-yne

**Answer:**



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15. IUPAC name of



- A. 1-Bromo-3-methylpropene
- B. 1-Bromobut-2-ene
- C. 1-Bromo-4-methylbut-2-ene
- D. 4-Bromobut-2-ene

**Answer:**



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