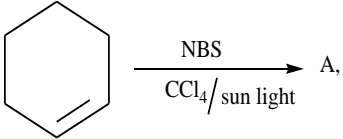
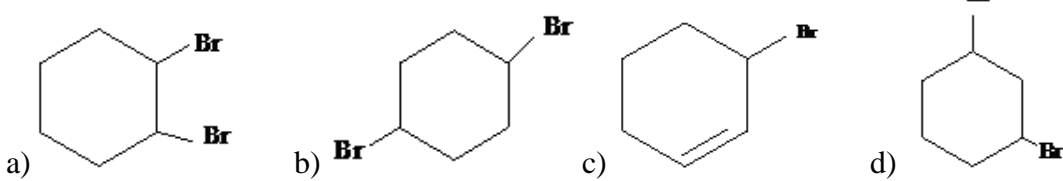
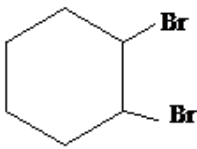
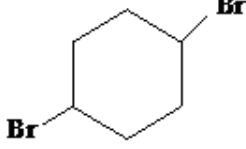
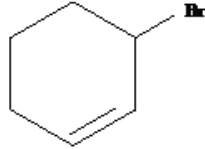
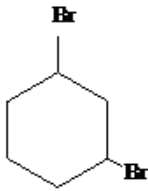


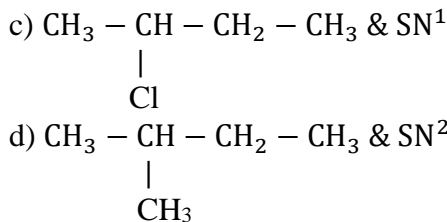
**Nomenclature and isomerism:**

- Which of the following are primaryhalides?  
 I. n-Butyl bromide                      II. Isobutyl bromide  
 III. sec-Butyl bromide                  IV. tert-Butyl bromide  
 a) Only I                      b) I and II                      c) I, II and III                      d) III and IV
- How many position isomers are represented by  $C_3H_6Cl_2$ ?  
 a) 2                      b) 3                      c) 4                      d) 5
- The best reagent for converting ethanol to chloroethane is  
 a)  $PCl_5$                       b)  $PCl_3$   
 c)  $SOCl_2$                       d) HCl in the presence of  $ZnCl_2$
- 1,2-dichloroethane when in the boiled with alcoholic potash gives  
 a) acetic acid                      b) formic acid                      c) potassium acetate                      d) vinyl chloride
- For the reaction  $C_2H_5OH + HX \xrightarrow{ZnX_2} C_2H_5X$  the order of reactivity is  
 a)  $HI > HCl > HBr$                       b)  $HI > HBr > HCl$                       c)  $HCl > HBr > HI$                       d)  $HBr > HI > HCl$
- $CH_3 - CH_2 - \underset{\substack{| \\ Cl}}{CH} - CH_3$  obtained by chlorination of n-butane, will be :  
 a) meso-form                      b) racemic mixture                      c) d-form                      d) l-form
- $CH_3CH_2OH \xrightarrow[443K]{Conc.H_2SO_4} A \xrightarrow{Br_2/CCl_4} B \xrightarrow[C_2H_5OH]{Zndust} C \xrightarrow[H_2O]{Br_2} D$  (major). IUPAC name of 'D' is  
 a) Ethane 1,2-diol                      b) 2-bromo ethanol  
 c) 1,2-dibromo ethane                      d) Bromo ethane
- $B \xleftarrow{HCl} CH_3 - CH_2 - CH = CH_2 \xrightarrow[peroxide]{HCl} A$ . A & B are  
 a) Chain isomers                      b) Positional isomers  
 c) Functional isomers                      d) Same compounds
- 

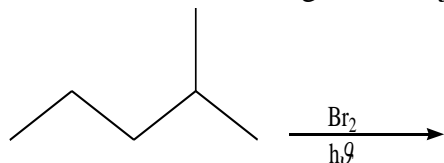
Product 'A' is



a)                       b)                       c)                       d) 
- $CH_3 - CH_2 - \underset{\substack{| \\ OH}}{CH} - CH_3 \xrightarrow{ZnCl_2/HCl} (X)$ . Identifying the X and the mechanism of the reaction  
 a)  $CH_3 - CH_2 - CH_2 - CH_2 - Cl$  &  $SN^1$   
 b)  $CH_3 - CH_2 - CH_2 - CH_2 - Cl$  &  $SN^2$

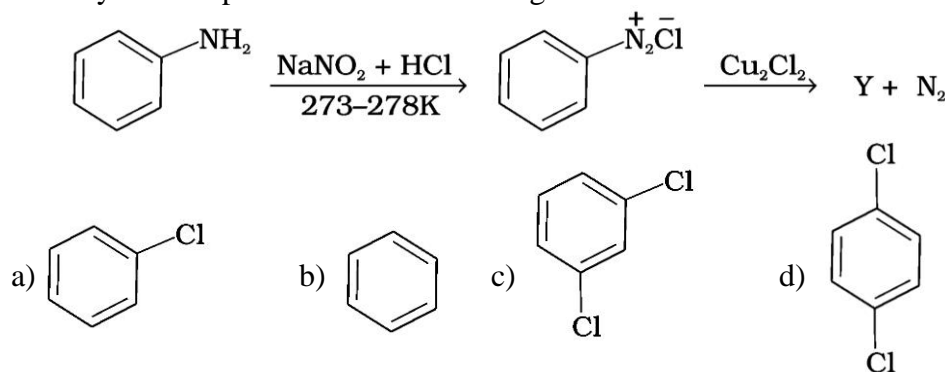


11. Which of the following is the major product for the given reaction?



- a) 2-Bromo – 2 – methyl pentane  
b) 1-Bromo – 2 – methyl pentane  
c) 4-Bromo – 2 – methyl pentane  
d) 3-Bromo – 2 – methyl pentane

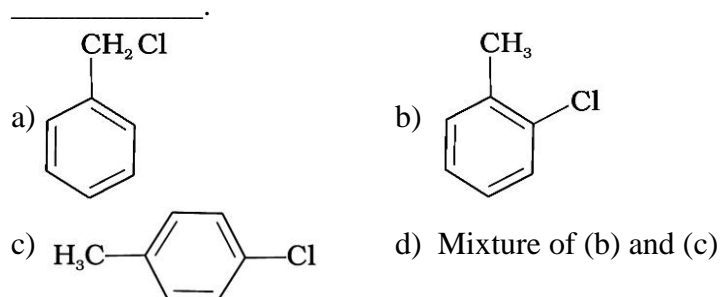
12. Identify the compound Y in the following reaction.



13. Toluene reacts with a halogen in the presence of iron (III) chloride giving ortho and para halo compounds. The reaction is

- a) Electrophilic elimination reaction      b) Electrophilic substitution reaction  
c) Free radical addition reaction          d) Nucleophilic substitution reaction

14. The reaction of toluene with chlorine in the presence of iron and in the absence of light yields



15. The reaction of toluene with  $\text{Cl}_2$  in presence of  $\text{FeCl}_3$  gives, 'X' and reaction in presence of light gives 'Y'. Thus 'X' and 'Y' are


- a) X=Benzal chloride, Y=o-Chlorotoluene  
b) X= m- Chlorotoluene, Y = p-Chlorotoluene  
c) X= o-and p-Chlorotoluene, Y=Trichloromethyl-benzene  
d) X= Benzyl chloride, Y= m- Chlorotoluene

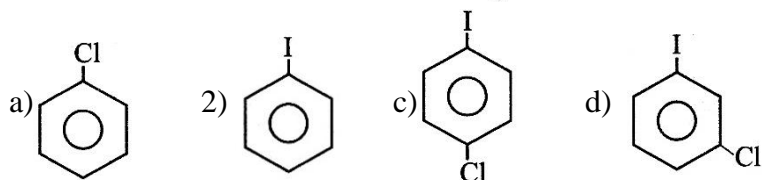
16. Which of the following is not formed when  $\text{Cl}_2$  is passed through boiling toluene in the presence of light ?

- a) Benzyl chloride                      b) Benzal chloride

c) Benzo tri chloride

d) o – and p – chloro toluene

17. The compound 'X' in the reaction  + ICl  $\xrightarrow{\text{Anhyd. AlCl}_3}$  X, is:



18. Fluorobenzene ( $\text{C}_6\text{H}_5\text{F}$ ) can be synthesized in the laboratory

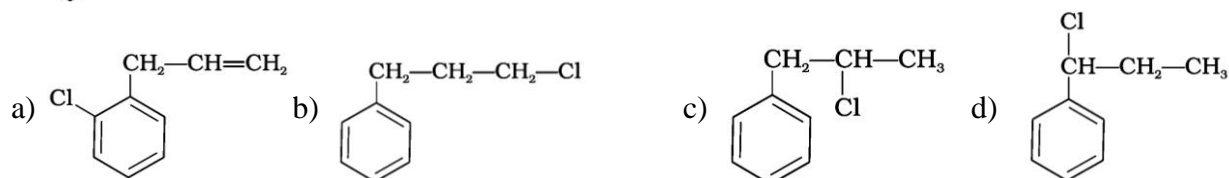
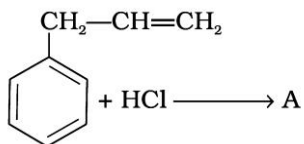
a) by heating phenol with HF and KF

b) from aniline by diazotisation followed by heating the diazonium salt with  $\text{HBF}_4$

c) by direct fluorination of benzene with  $\text{F}_2$  gas

d) by reacting bromobenzene with NaF solution

19. What is 'A' in the following reaction?



20. How many enantiomeric pairs can be obtained by monobromination of iso-pentane?

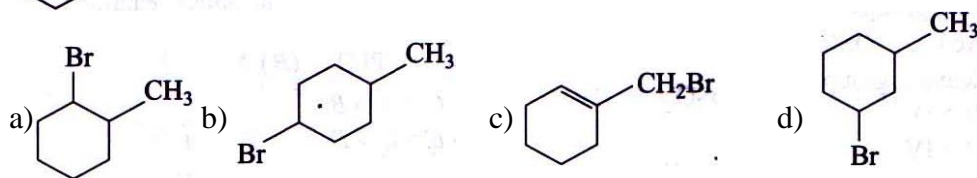
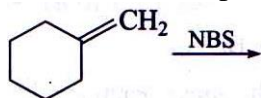
a) 3

b) 1

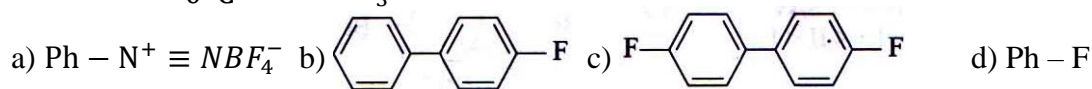
c) 2

d) 4

21. What will be the product in the following reaction?



22.  $\text{Ph} - \text{NH}_2 \xrightarrow[0^\circ\text{C}]{\text{HNO}_2}$  A  $\xrightarrow[\text{BF}_3]{\text{HF}}$  B  $\xrightarrow{\Delta}$  C, C is:



23.  $\text{H}_3\text{C} - \text{CH} = \text{CH}_2 + \text{HCl} \xrightarrow{\text{Peroxide}}$  Product, the intermediate of reaction is

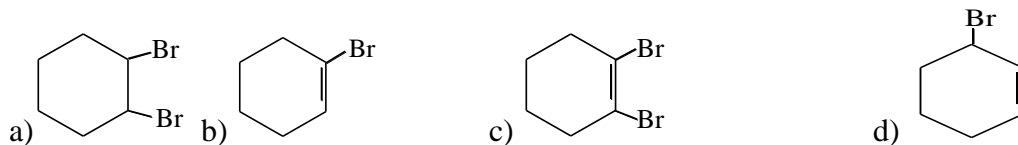
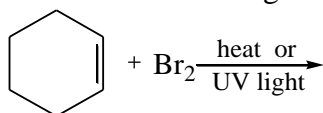
a)  $\text{CH}_3 - \dot{\text{C}}\text{H} - \text{CH}_3$

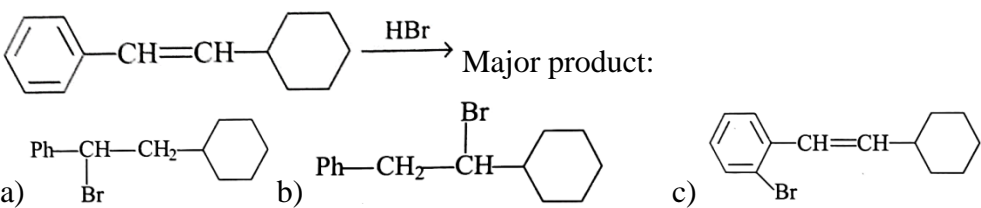
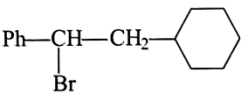
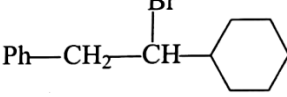
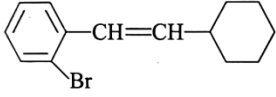
b)  $\text{CH}_3 - \text{CH}_2 - \dot{\text{C}}\text{H}_2$

c)  $\text{CH}_3 - \overset{+}{\text{C}}\text{H} - \text{CH}_3$

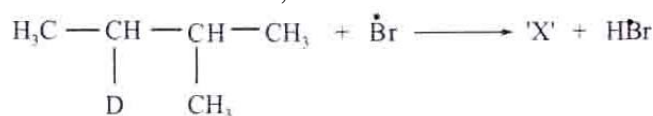
d)  $\text{CH}_3 - \text{CH}_2 - \overset{+}{\text{C}}\text{H}_2$

24. Which of the following monohalo product is formed in the following reaction

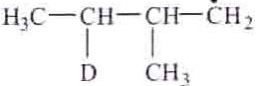
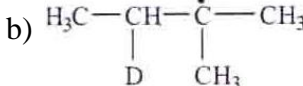
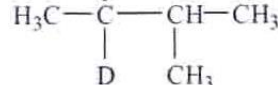
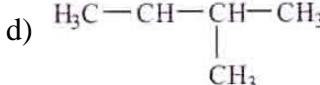


25.  Major product:
- a)  b)  c)  d) Both (a) & (b)

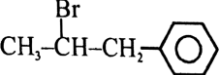
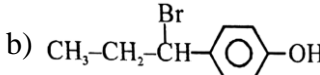
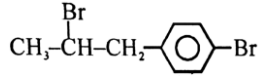
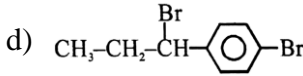
26. Consider the reaction,



Identify the structure of the major product 'X'

- a)  b)   
 c)  d) 

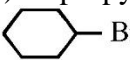
27. The major product of the reaction is  $\text{CH}_3-\text{CH}=\text{CH}-\text{C}_6\text{H}_4-\text{OH} + \text{HBr} \longrightarrow$


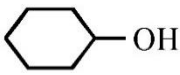
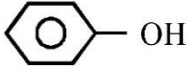
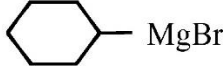
- a)  b)   
 c)  d) 

### Properties:

28. A mixture of two organic chlorine compounds was treated with sodium metal in ether solution. Isobutane was obtained as a product. The two chloro compounds are

- a) methyl chloride and propyl chloride  
 b) methyl chloride and ethyl chloride  
 c) isopropyl chloride and methyl chloride  
 d) isopropyl chloride and ethyl chloride

29.  + Mg  $\xrightarrow{\text{dry ether}}$  A  $\xrightarrow[\text{H}^+]{\text{H}_2\text{O}}$  B. The product 'B' is

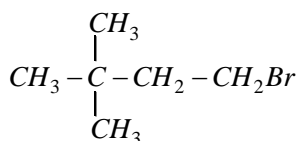
- a)  b)  c)  d) 

30. Which of the following can be used to reduce 2° alkyl halide to corresponding alkane?

- a)  $\text{LiAlH}_4$  b)  $\text{NaBH}_4$  c)  $\text{Ph}_3\text{SnH}$  d) All of these

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

- a) it is insoluble in water b) the reagent is highly reactive in ether  
 c) the reagent reacts with water d) the reagent becomes inactive in water

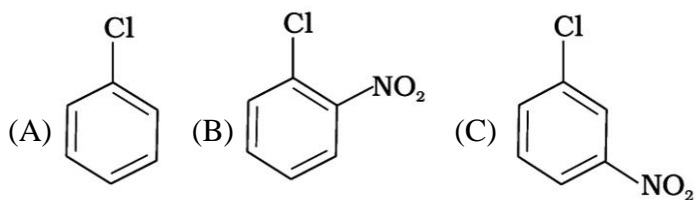


32.  $\xrightarrow{\text{alc. KOH}} \text{A} \xrightarrow{\text{H}_3\text{O}^+} \text{B} \xrightarrow[\Delta]{\text{H}^+} \text{C}.$

A and C are

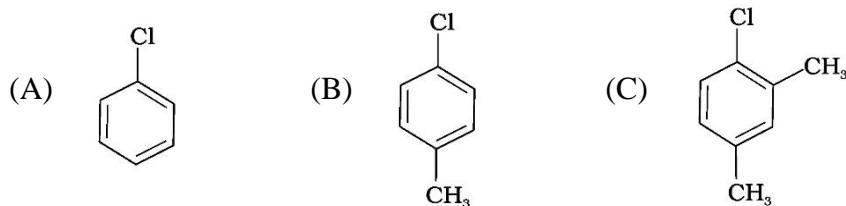
- a) Same compounds b) Chain isomers  
 c) Positional isomers d) Geometrical isomers

33. Arrange the compounds in increasing order of rate of reaction towards nucleophilic substitution.



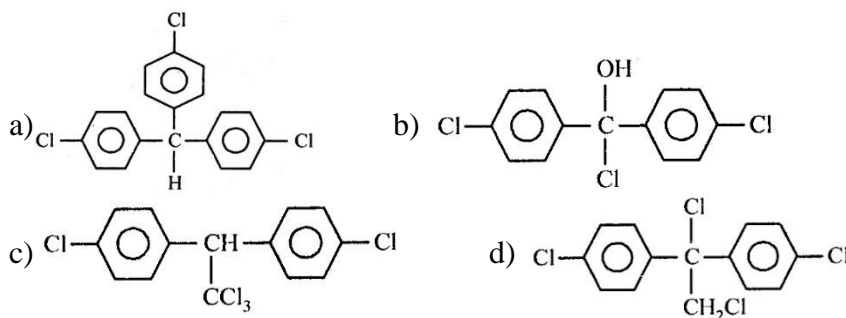
- a) (A) < (B) < (C)    b) (C) < (B) < (A)    c) (A) < (C) < (B)    d) (C) < (A) < (B)

34. Arrange the compounds in increasing order of rate of reaction towards nucleophilic substitution.



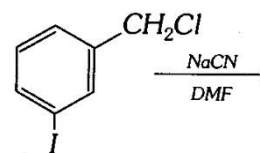
- a) (A) < (B) < (C)    b) (B) < (A) < (C)    c) (C) < (B) < (A)    d) (A) < (C) < (B)

35. Trichloroacetaldehyde,  $\text{CCl}_3\text{CHO}$  reacts with chlorobenzene in presence of sulphuric acid and produces:

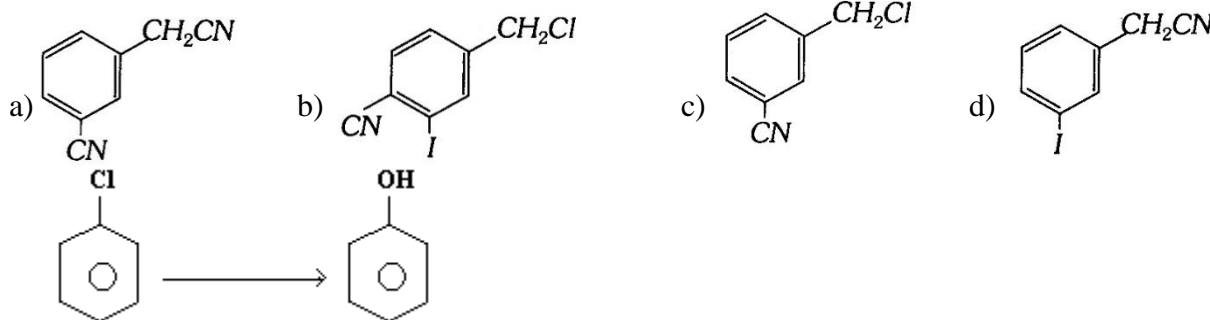


36. Which one is most reactive towards  $\text{S}_\text{N}1$  reaction?

- a)  $\text{C}_6\text{H}_5\text{CH}(\text{C}_6\text{H}_5)\text{Br}$     b)  $\text{C}_6\text{H}_5\text{CH}(\text{CH}_3)\text{Br}$   
 c)  $\text{C}_6\text{H}_5\text{C}(\text{CH}_3)(\text{C}_6\text{H}_5)\text{Br}$     d)  $\text{C}_6\text{H}_5\text{CH}_2\text{Br}$



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



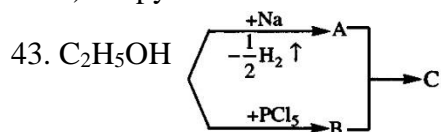
Reagent required in the given conversion

- a) NaOH, warm    b) NaOH, 443 K,  $\text{H}^+$   
 c) NaOH, 300 atm, 623 K,  $\text{H}^+$     d) NaOH, 300 atm, 623 K,  $\text{OH}^-$

39. Incorrect statement about nucleophilic substitution reactions is

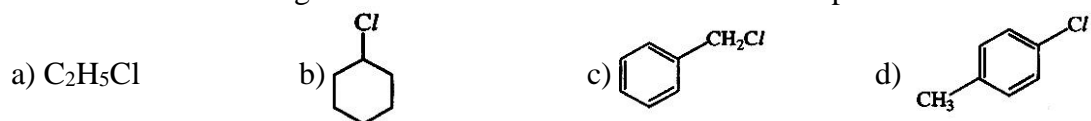
- a) A bulky nucleophile prefers elimination  
 b) Benzyl halides are more reactive in  $\text{S}_\text{N}1$  reactions  
 c) Aryl halides are more reactive than alkyl halides  
 d) Nucleophile has no influence on the rate of  $\text{S}_\text{N}1$  reactions

40. Chlorobenzene on treatment with sodium in dry ether gives diphenyl. The name of the reaction is  
 a) Fitting reaction                      b) Wurtz-fitting reaction  
 c) Sandmeyer reaction                d) Gatterman reaction
41. Ethyl chloride on heating with silver cyanide forms a compound 'X'. The functional isomer of 'X' is  
 a)  $C_2H_5NC$                       b)  $C_2H_5CN$                       c)  $CH_3-NH-CH_3$                       d)  $(CH_3)_3N$
42. Butanenitrile is formed by reaction of KCN with  
 a) Propyl alcohol                      b) Butyl chloride                      c) Butyl alcohol                      d) Propyl chloride

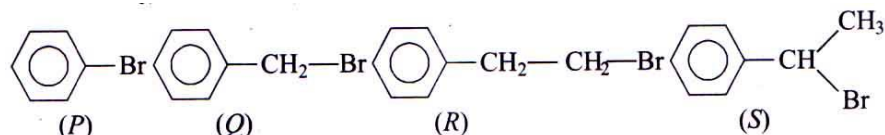


Total number of hybrid orbitals involved in bonding in a molecule of 'C' is

- a) 12                      b) 10                      c) 18                      d) 16
44. The carbon compound "A" forms "B" with sodium metal and again forms "C" with  $PCl_5$  but "B" reacts with "C" to form diethyl ether. Therefore A, B and C are respectively.  
 a)  $C_2H_5OH$ ,  $C_2H_5OCl$ ,  $C_2H_5ONa$                       b)  $C_2H_5OH$ ,  $C_2H_6$ ,  $C_2H_5$   
 c)  $C_2H_5Cl$ ,  $C_2H_6$ ,  $C_2H_5Cl$                       d)  $C_2H_5OH$ ,  $C_2H_5ONa$ ,  $C_2H_5Cl$
45. Which of the following will be the least reactive towards nucleophilic substitution?

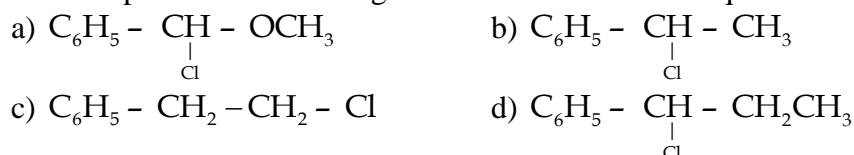


46. Rate of  $S_N1$  reaction is:

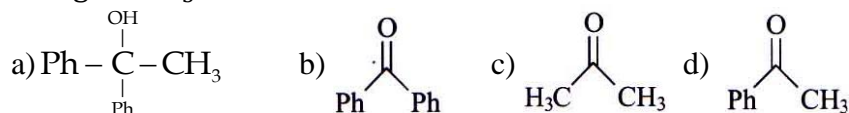


- a)  $S > Q > R > P$                       b)  $S > R > P > Q$                       c)  $P > Q > R > S$                       d)  $S > R > Q > P$

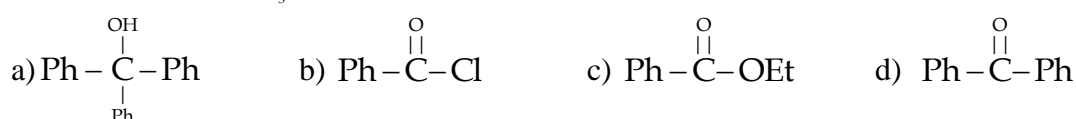
47. The compound which undergoes fastest reaction with aq. NaOH solution is:



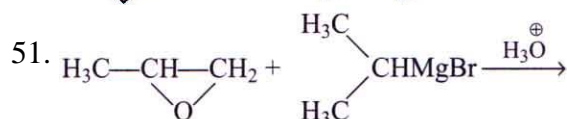
48.  $PhMgBr + H_3C - C \equiv N \xrightarrow{H_3O^+}$  Product:

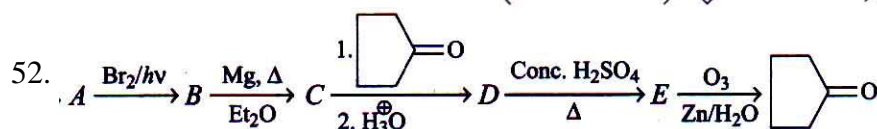
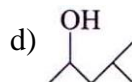
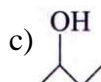
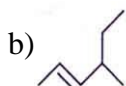
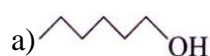


49.  $Cl - \overset{\text{O}}{\underset{||}{C}} - OEt \xrightarrow[H_3O^+]{PhMgBr(Excess)}$  Product:

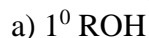
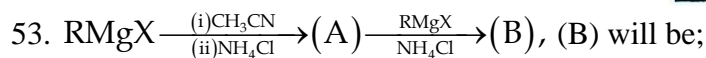
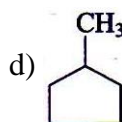
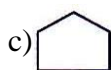
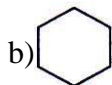
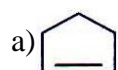


50.  Compound (P) is:





Find out the structure of 'A':



54. Which is not correct about  $S_N2$ ?

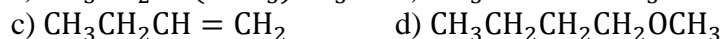
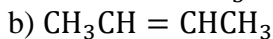
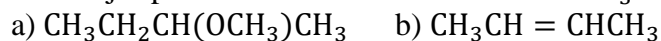
a) Role of  $S_N2$  is faster in polar aprotic solvents

b) Rate of  $S_N2$  is directly proportional to the nature of leaving group

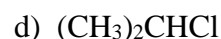
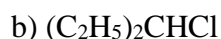
c) Rate of  $S_N2$  inversely proportional to the steric hindrance present in substrate

d) Rate of  $S_N2$  increases as stability of carbocation increases

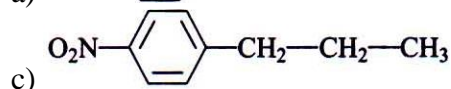
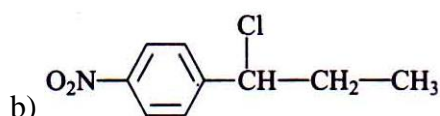
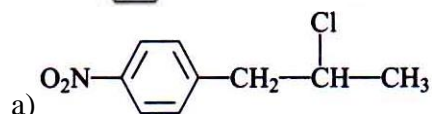
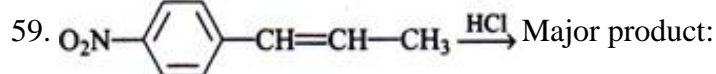
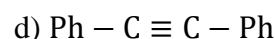
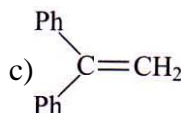
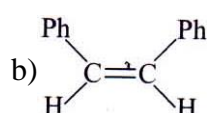
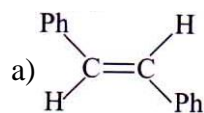
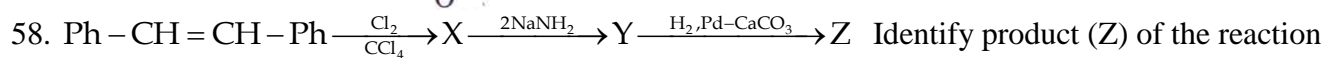
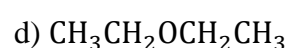
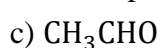
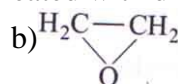
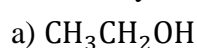
55. The major product obtained on treatment of  $CH_3CH_2CH(F)CH_3$  with  $CH_3O^-/CH_3OH$  is:



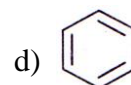
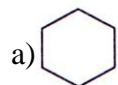
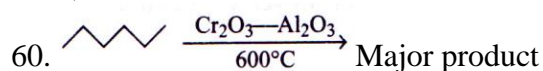
56. The organic chloro compound. Which shows complete stereo chemical inversion during a  $S_N2$  reaction, is:



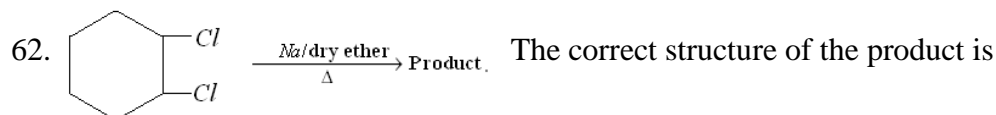
57. When ethyl iodide is heated with dry silver oxide, the product formed is:

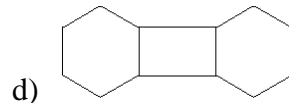
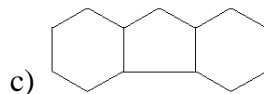
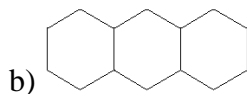
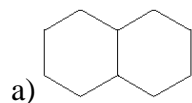


d) None of these

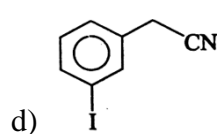
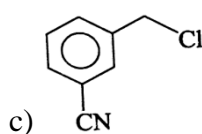
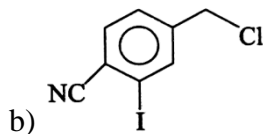
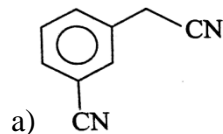
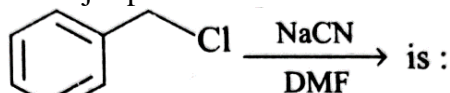


61. Which of the following alkyl halides is not suitable for Corey-House synthesis of alkanes?

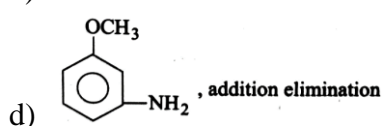
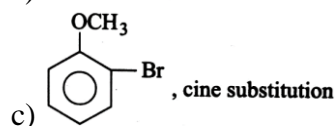
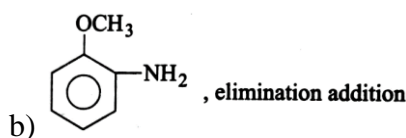
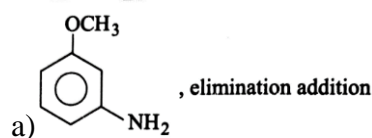




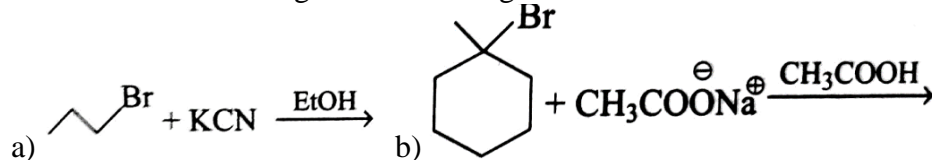
63. The major product formed in the following reaction



64. major product A and R are:



65. Which of the following reactions will go faster if concentration of nucleophile is increased?



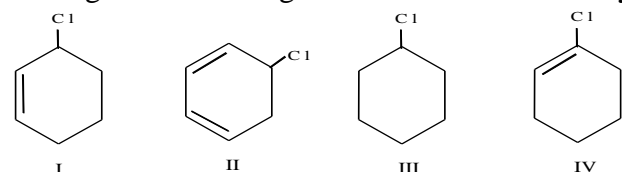
66. Grignard reagent gives alkane with

- a)  $\text{H}_2\text{O}$       b)  $\text{C}_2\text{H}_5\text{OH}$       c)  $\text{C}_2\text{H}_5\text{NH}_2$       d) all of these

67. An alkane,  $\text{C}_7\text{H}_{16}$ , is produced by the reaction of lithium di(3-pentyl) cuprate with ethyl bromide. The alkane is

- a) n-pentane      b) neopentane  
c) 3-ethylpentane      d) isobutene

68. Arrange the following in order of their reactivity towards dehydrohalogenation

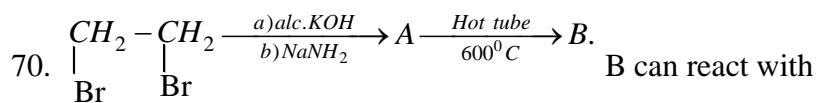


- a)  $\text{II} > \text{I} > \text{III} > \text{IV}$       b)  $\text{III} > \text{II} > \text{I} > \text{IV}$   
c)  $\text{IV} > \text{III} > \text{I} > \text{II}$       d)  $\text{I} > \text{II} > \text{III} > \text{IV}$

69.  $\text{H}_3\text{C}-\text{CH}_2-\text{Br} + \text{Na} \xrightarrow{\text{dry ether}} \text{X}$ . X is

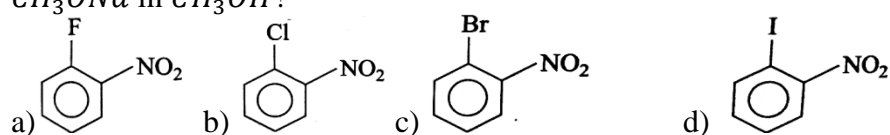
- a) Butane      b) Ethene      c) Ethane      d) All of these



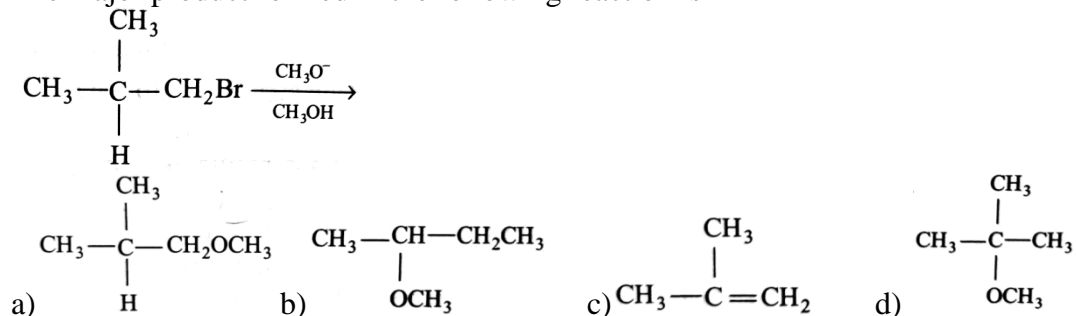


- a)  $\text{Br}_2/\text{CCl}_4$       b)  $\text{KMnO}_4/\text{OH}^-$ , cold      c) HBr      d) Oleum

71. Which of the following compounds will undergo substitution of the halogen atom most readily with  $\text{CH}_3\text{ONa}$  in  $\text{CH}_3\text{OH}$ ?



72. The major product formed in the following reaction is



73. Which of the following reactions gives  $\text{H}_2\text{C} = \text{C} = \text{C} = \text{CH}_2$ ?

