28. Haloalkanes and Haloarenes – Multiple Choice Questions

1. Preparation of Alkyl Halides

1. What is the main product of the reaction between 2-methyl propene with *HBr*

(a) 1-bromo butane

(b) 1-bromo-2 methyl propane

(c) 2-bromo butane

(d) 2-bromo-2 methyl propane

2. The product of the following reaction

$CH_2 = CH - CCl_3 + HBr$

(a) $CH_3 - CH(Br) - CCl_3$ (b) $CH_2(Br) - CH_2 - CCl_3$

(c) $BrCH_2 - CHCl - CHCl_2$ (d) $CH_3 - CH_2 - CCl_3$

3. $R - OH + HX \rightarrow R - X + H_2O$

In the above reaction, the reactivity of different alcohols is

(a) Tertiary > Secondary > Primary

(b) Tertiary < Secondary < Primary

(c) Tertiary < Secondary > Primary

(d) Secondary < Primary < Tertiary

4. 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

5. 2-Methylpropane on monochlorination under photochemical condition give

(a) 2-chloro-2-methylpropane as major product

(b) (1:1) mixture of 1-chloro-2-methylpropane and 2-chloro-2- methylpropane

(c) 1-chloro-2-methylpropane as a major product

(d) (1:9) mixture of 1-chloro-2-methylpropane and 2-chloro-2-methylpropane

6. Which one is the Swartz reaction from the following

(a) $CH_3Br + NaI \xrightarrow{\text{acetone}} CH_3I + NaCl$

(b) $CH_3Br + NaI \xrightarrow{\text{acetone}} CH_3I + NaBr$

(c) $CH_3Br + AgF \longrightarrow CH_3F + AgBr$

(d) $2\,CH_3Cl + 2\,Na \xrightarrow{\text{Dry ether}} CH_3.CH_3 + 2\,NaCl$

2. Properties of Alkyl Halides

1. Under identical conditions, the S_{N^1} reaction will occur most efficiently with

(a) *Tert*-butyl chloride

(b) 1-chlorobutane

(c) 2-methyl-1-chloropropane

(d) 2-chlorobutane

2. Identify X and Y in the following sequence

$C_2H_5Br \xrightarrow{X} \text{product} \xrightarrow{Y} C_3H_7NH_2$

(a) $X = KCN, Y = LiAlH_4$

(b) $X = KCN, Y = H_3O^+$

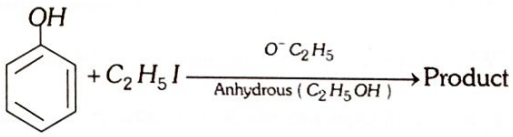
(c) $X = CH_3Cl, Y = AlCl_3 / HCl$

(d) $X = CH_3NH_2, Y = HNO_2$

3. 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) $H_3C - NH - CH_3$ (d) $C_2H_5NH_2$

4. 

In the above reaction product is

(a) $C_6H_5OC_2H_5$ (b) $C_2H_5OC_2H_5$

(c) $C_6H_5OC_6H_5$ (d) C_6H_5I

5. Consider the following reaction

$C_2H_5Cl + AgCN \xrightarrow{EtOH / H_2O} X\ (major)$

Which one of the following statements is true for X

(a) It gives propionic acid on hydrolysis

(b) It has an ester functional group

(c) It has a nitrogen linked to ethyl carbon

(d) It has a cyanide group

6. When methyl bromide is heated with *Zn* it gives

(a) CH_4 (b) C_2H_6

(c) C_2H_4 (d) CH_3OH

7. When alkyl halide is heated with dry Ag_2O, it produces

(a) Ester (b) Ether

(c) Ketone (d) Alcohol

8. Which of the following haloalkanes is most reactive

(a) 1-chloropropane (b) 1-bromopropane

(c) 2-chloropropane (d) 2-bromopropane

9. The order of rate of hydrolysis of alkyl halides 1°, 2°, 3° and CH_3X by the S_{N^2} pathway is

(a) $1° > 2° > 3° > CH_3X$ (b) $CH_3X > 3° > 2° > 1°$

(c) $CH_3X > 1° > 2° > 3°$ (d) $3° > 2° > 1° > CH_3X$

10. Among the choices of alkyl bromide, the least reactive bromide in a S_{N^2} reaction is

(a) 1-bromopentane (b) 2-bromo-2-methylbutane

(c) 1-bromo-3-methylbutane (d) 1-bromo-2-methylbutane

11. The hydrolysis of optically active 2- bromobutane with aqueous $NaOH$ result in the formation of

(a) (±) butan–1–*ol* (b) (+) butan–2–*ol*

(c) (±) butan–2–*ol* (d) (–) butan–2–*ol*

12. Reactivity order of halides for dehydrohalogenation is

(a) $R-F > R-Cl > R-Br > R-I$

(b) $R-I > R-Br > R-Cl > R-F$

(c) $R-I > R-Cl > R-Br > R-F$

(d) $R-F > R-I > R-Br > R-Cl$

13. Wurtz reaction of methyl iodide yields an organic compound X. Which one of the following reactions also yields X

(a) $C_2H_5Cl + Mg \xrightarrow{\text{dry ether}}$

(b) $C_2H_5Cl + LiAlH_4 \longrightarrow$

(c) $C_2H_5Cl + C_2H_5ONa \longrightarrow$

(d) $CHCl_3 \xrightarrow[\Delta]{Ag\ \text{powder}}$

14. The order of reactivity of following alcohols with halogen acids is.....

(i) $CH_3CH_2-CH_2-OH$ (ii) $CH_3CH_2-\underset{\displaystyle CH_3}{\overset{\displaystyle |}{CH}}-OH$

(iii) $CH_3CH_2-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{\displaystyle |}{\underset{\displaystyle |}{C}}}}-OH$

(a) (i) > (ii) > (iii) (b) (iii) > (ii) > (i)

(c) (ii) > (i) > (iii) (d) (i) > (iii) > (ii)

15. Which of the following alcohols will yield the corresponding alkyl chloride on reaction with concentrated HCl at room temperature

(a) $CH_3CH_2-CH_2-OH$

(b) $CH_3CH_2-\underset{\displaystyle CH_3}{\overset{\displaystyle |}{CH}}-OH$

(c) $CH_3CH_2-\underset{\displaystyle CH_3}{\overset{\displaystyle |}{CH}}-CH_2OH$

(d) $CH_3CH_2-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{\displaystyle |}{\underset{\displaystyle |}{C}}}}-OH$

16. Which reagent will you use for the following reaction

$CH_3CH_2CH_2CH_3 \rightarrow CH_3CH_2CH_2CH_2Cl$

$+ CH_3CH_2CHClCH_3$

(a) Cl_2/UV light

(b) $NaCl + H_2SO_4$

(c) Cl_2 gas in dark

(d) Cl_2 gas in the presence of iron in dark

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

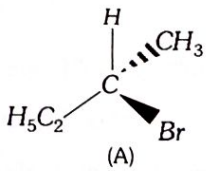
(i) $\begin{matrix} CH_3 \\ CH_3 \end{matrix}\!\!>\!\!CH-CH_2Br$ (ii) $CH_3CH_2CH_2CH_2Br$

(iii) $H_3C-\underset{\displaystyle Br}{\overset{\displaystyle CH_3}{\overset{\displaystyle |}{\underset{\displaystyle |}{C}}}}-CH_3$

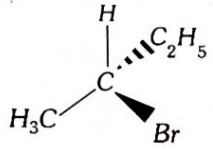
(a) (ii) < (i) < (iii) (b) (i) < (ii) < (iii)

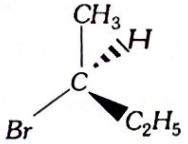
(c) (iii) < (i) < (ii) (d) (iii) < (ii) < (i)

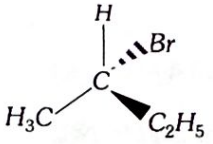
18. Which of the following structures is enantiomeric with the molecule (A) given below

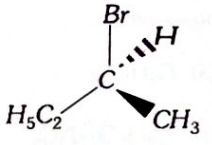


(A)

(a) 

(b) 

(c) 

(d) 

19. Which is the correct IUPAC name for $CH_3 - \underset{\underset{C_2H_5}{|}}{CH} - CH_2 - Br$

(a) 1-bromo-2-ethylpropane

(b) 1-bromo-2-ethyl-2-methylethane

(c) 1-bromo-2-methylbutane

(d) 2-methyl-1-bromobutane

20. Molecules whose mirror image is non-superimposable over them are known as chiral. Which of the following molecules is chiral in nature

(a) 2-bromobutane (b) 1-bromobutane

(c) 2-bromopropane (d) 2-bromopropan-2-ol

21. Which is the correct increasing order of boiling points of the following compounds

1-iodobutane, 1-bromobutane, 1-chlorobutane, Butane

(a) Butane < 1-chlorobutane < 1-bromobutane < 1-iodobutane

(b) 1-iodobutane < 1-bromobutane < 1-chlorobutane < Butane

(c) Butane < 1-iodobutane < 1-bromobutane < 1-chlorobutane

(d) Butane < 1-chlorobutane < 1-iodobutane <1-bromobutane

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

23. In the following sequence of reactions

$CH_3CH_2CH_2Br \xrightarrow{KOH(alc)} (A) \xrightarrow{HBr} (B) \xrightarrow{KOH(aq.)} (C)$,

The product (C) is

(a) Propan-2-ol (b) Propan-1-ol

(c) Propyne (d) Propene

24. In alkaline hydrolysis of a tertiary alkyl halide by aqueous alkali if concentration of alkali is doubled, then the reaction

(a) Will be doubled (b) Will be halved

(c) Will remain constant (d) Can't say

25. When ethyl iodide is heated with silver nitrate, the product obtained is

(a) C_2H_5Ag (b) $Ag-O-NO_2$

(c) $C_2H_5O-NO_2$ (d) $C_2H_5I-NO_2$

26. An alkyl bromide produces a single alkene when it reacts with sodium ethoxide and ethanol. This alkene undergoes hydrogenation and produces 2-methyl butane. What is the identity of the alkyl bromide

(a) 1-bromo-2, 2-dimethylpropane

(b) 1-bromobutane

(c) 1-bromo-2-methylbutane

(d) 2-bromo-2-methylbutane

(e) 2-bromopentane

27. An alkyl bromide (X) reacts with Na to form 4, 5-diethyloctane. Compound X is

(a) $CH_3(CH_2)_3Br$

(b) $CH_3(CH_2)_5Br$

(c) $CH_3(CH_2)_3CH.Br.CH_3$

(d) $CH_3(CH_2)_2CH.Br.CH_2CH_3$

28. Which of the following is liquid at room temperature

(a) CH_3I (b) CH_3Br

(c) C_2H_5Cl (d) CH_3F

29. The hydrolysis of 2–bromo–3–methylbutane by S_{N^1} mechanism gives mainly

(a) 3–methyl–2–butanol (b) 2–methyl–2–butanol

(c) 2,2–dimethyl–2–propanol (d) 2–methyl–1–butanol

(e) 1–pentanol

30. Alkyl iodide reacts with $NaCN$ to give alkyl cyanide and small amount of alkyl isocyanide. Formation of these two products is due to the

(a) Ionic character of $NaCN$

(b) Nucleophilic character of CN^-

(c) Ambidentate character of CN^-

(d) Electrophilic character of CN^-

31. 2-bromobutane reacts with OH^- in H_2O to give 2-butanol. The reaction involves

(a) Retention in configuration

(b) Inversion in configuration

(c) Racemization

(d) Mutarotation

32. Which chlorine atom is more electronegative in the following

(a) $CH_3 - Cl$ (b) $CH_3 - CH_2 - Cl$

(c) $H - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - Cl$ (d) $CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - Cl$

33. A primary alkyl halide would prefer to undergo.....

(a) S_N1 reaction (b) S_N2 reaction

(c) α -elimination (d) Racemisation

34. Which of the following alkyl halides will undergo S_N1 reaction most readily

(a) $(CH_3)_3C-F$ (b) $(CH_3)_3C-Cl$

(c) $(CH_3)_3C-Br$ (d) $(CH_3)_3C-I$

35. What should be the correct IUPAC name for diethylbromomethane

(a) 1-bromo-1, 1-diethylmethane

(b) 3-bromopentane

(c) 1-bromo-1-ethylpropane

(d) 1-bromopentane

36. Chloromethane on treatment with excess of ammonia yields mainly

(a) N, N-dimethylmethanamine $\left(CH_3-N\begin{matrix}CH_3\\CH_3\end{matrix}\right)$

(b) N-methylmethanamine $(CH_3-NH-CH_3)$

(c) Methanamine (CH_3NH_2)

(d) Mixture containing all these in equal proportion

37. Which of the following compounds will give racemic mixture on nucleophilic substitution by OH^- ion

(i) $CH_3-\underset{\displaystyle C_2H_5}{\underset{|}{CH}}-Br$ (ii) $CH_3-\underset{\displaystyle C_2H_5}{\overset{\displaystyle Br}{\overset{|}{\underset{|}{C}}}}-CH_3$

(iii) $CH_3-\underset{\displaystyle C_2H_5}{\overset{\displaystyle \bullet}{\underset{|}{CH}}}-CH_2Br$

(a) (i) (b) (i), (ii) and (iii)

(c) (ii) and (iii) (d) (i) and (iii)

38. In presence of $AlCl_3$, benzene and *n*-propyl bromide react in Friedal-Craft's reaction to form

(a) *n*-propyl benzene

(b) 1, 2-dinormal propyl benzene

(c) 1, 4-dinormal propyl benzene

(d) Isopropyl benzene

39. CH_3-CH_2-Br on treatment with $LiAlH_4$ gives ethane gas while $(CH_3)_3C-Br$ on same treatment gives H_2 gas because

(a) The former is S_{N^2} and later is E2 reaction

(b) The former is E2 and later is S_{N^2} reaction

(c) The former is S_{N^1} and later is $E2$ reaction

(d) The former is E2 and later is S_{N^1} reaction

40. In the solvolysis of 3–methyl–3–bromohexane, which of the following statement is not correct

(a) It involves carbocation intermediate

(b) The intermediate involves sp^2 carbon

(c) Polar solvents accelerates the reaction

(d) The rate of the reaction depends upon 3–methyl–3–bromo hexane concentration

(e) It involves inversion of configuration

41. An alkyl halide with molecular formula $C_6H_{13}Br$ on dehydrohalogenation gave two isomeric alkenes *X* and *Y* with molecular formula C_6H_{12}. On reductive ozonolysis, *X* and *Y* gave four compounds CH_3COCH_3, CH_3CHO, CH_3CH_2CHO and $(CH_3)_2CHCHO$. The alkyl halide is

(a) 2-bromohexane

(b) 2, 2-dimethyl-1-bromobutane

(c) 4-bromo-2-methylpentane

(d) 2-bromo-2, 3-dimethylbutane

(e) 3-bromo-2-methylpentane

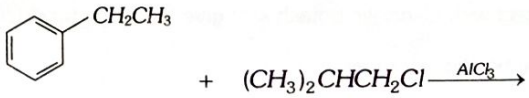
42. An organic compound $A(C_4H_9Cl)$ on reaction with *Na*/diethyl ether gives a hydrocarbon, which on monochlorination gives only one chloro derivative. *A* is

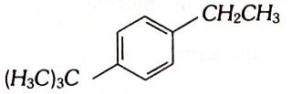
(a) *t*-butyl chloride (b) *s*-butyl chloride

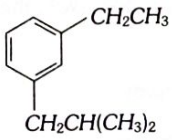
(c) Isobutyl chloride (d) *n*-butyl chloride

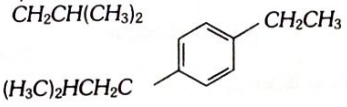
(e) None of these

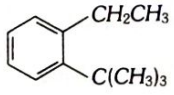
43. The major product of the following reaction is



(a) 

(b) 

(c) 

(d) 

3. Dihalides, Trihalides, Tetrahalides, Unsaturated Halides

1. Which of the following is an example of *vic*-dihalide

(a) Dichloromethane (b) 1, 2-dichloroethane

(c) Ethylidene chloride (d) Allyl chloride

2. In methyl alcohol solution, bromine reacts with ethylene to yield $BrCH_2CH_2OCH_3$ in addition to 1, 2-dibromoethane because

(a) The ion formed initially may react with Br^- or CH_3OH

(b) The methyl alcohol solvates the bromine

(c) The reaction follows Markownikoff's rule

(d) This is a free-radical mechanism

3. From which one of the following, both ethylene and acetylene could be prepared in a single step reaction

(a) CH_3CH_2OH (b) $Br-CH_2-CH_2-Br$

(c) CH_3CH_2Br (d) $Br-CH_2-CH_2-OH$

(e) CH_3COOH

4. Which of the following reactions gives $H_2C=C=C=CH_2$

(a) $CH_2Br-CBr=CH_2 \xrightarrow{Zn/CH_3OH}$

(b) $HC\equiv C-CH_2-COOH \xrightarrow[40^\circ C]{Aq.K_2CO_3}$

(c) $CH_2Br-C\equiv C-CH_2Br \xrightarrow[Heat]{Zn}$

(d) $2CH_2=CH-CH_2I \longrightarrow$

5. Ethylene dichloride and ethylidine chloride are isomeric compounds. The false statement about these isomers is that they

(a) React with alcoholic potash and give the same product

(b) Are position isomers

(c) Contain the same percentage of chlorine

(d) Are both hydrolysed to the same product

6. If, 1,3-dibromopropane reacts with zinc and NaI, the product obtained is

(a) Propene (b) Propane

(c) Cyclopropane (d) Hexane

7. Ethylidene chloride is a/an.....

(a) Vic-dihalide (b) Gem-dihalide

(c) Allylic halide (d) Vinylic halide

8. Mesodibromobutane on debromination gives

(a) *Trans*-2-butene (b) *Cis*-2-butene

(c) 1-butene (d) 1-butyne

9. An isomer of $C_3H_6Cl_2$ on boiling with aqueous KOH gives acetone. Hence, the isomer is

(a) 2, 2-dichloropropane (b) 1, 2-dichloropropane

(c) 1, 1-dichloropropane (d) 1, 3-dichloropropane

10. Which of the following reaction leads to the formation of chloretone

(a) $CHCl_3+CH_3COCH_3$ (b) CCl_4 + Acetone

(c) $CHCl_3+KOH$ (d) $CHCl_3+HNO_3$

11. Iodoform is formed on warming I_2 and $NaOH$ with

(a) C_2H_5OH (b) CH_3OH

(c) $HCOOH$ (d) C_6H_6

12. Chloropicrin is

(a) Trichloro acetaldehyde (b) Nitrochloroform

(c) 2,4,6-trinitro phenol (d) None of these

13. $AgNO_3$ does not give precipitate with $CHCl_3$ because

(a) $CHCl_3$ does not ionise in water

(b) $AgNO_3$ does not reacts with $CHCl_3$

(c) $CHCl_3$ is chemically inert

(d) None of these

14. Iodoform on heating with KOH gives

(a) CH_3CHO (b) CH_3COOK

(c) $HCOOK$ (d) $HCHO$

15. Chloroform with zinc dust in water gives

(a) CH_4 (b) Chloropicrin

(c) CCl_4 (d) CH_2Cl_2

16. Which of the following can give iodoform test

(a) $Cl_3COCH_2CH_3$ (b) CH_3CH_2OH

(c) CH_3CH_2CHO (d) Both (a) and (b)

17. Chloroform reacts with the following compound to give a hypnotic

(a) Phenol (b) $R-NH_2$

(c) Acetone (d) HNO_3

18. Which one of the following processes does not occur during formation of $CHCl_3$ from C_2H_5OH and bleaching powder

(a) Hydrolysis (b) Oxidation

(c) Reduction (d) Chlorination

19. Which of the following statements about chloroform is false

(a) It is a colourless, sweet-smelling liquid

(b) It is almost insoluble in water

(c) It is highly inflammable

(d) It can be used as an inhalational anaesthetic agent

20. On heating $CHCl_3$ with aq. $NaOH$, the product is

(a) CH_3COONa (b) $HCOONa$

(c) Sodium oxalate (d) CH_3OH

21. The compound added to prevent chloroform to form phosgene gas is

(a) C_2H_5OH (b) CH_3COOH

(c) CH_3COCH_3 (d) CH_3OH

22. Hydrolysis of trichloromethane with aqueous KOH gives

(a) Methanol (b) Acetic acid

(c) Ethanol (d) Formic acid

23. A salt solution is treated with chloroform drops. Then it is shaked with chlorine water. Chloroform layer becomes violet. Solution contains

(a) NO_2^- ion (b) NO_3^- ion

(c) Br^- ion (d) I^- ion

24. Iodoform can be prepared from all, except

(a) Propan-l-ol (b) Propan-2-ol

(c) Acetophenone (d) Butan-2-one

25. What is the product formed in the following reaction $C_6H_5OH + CCl_4 \xrightarrow[(2)\ H^+]{(1)\ NaOH}$

(a) *p*-hydroxybenzoic acid (b) *o*-hydroxybenzoic acid

(c) Benzaldehyde (d) Salicylaldehyde

26. The less reactivity of chlorine atom in $CH_2 = CH - Cl$ is due to

(a) Inductive effect (b) Resonance stabilization

(c) Electromeric effect (d) Electronegativity

27. Vinyl chloride reacts with HCl to form

(a) 1, 1- dichloro ethane

(b) 1, 2- dichloro ethane

(c) Tetrachloro ethylene

(d) Mixture of 1, 2 and 1, 1 – dichloro ethane

28. Allyl chloride on dehydro chlorination gives

(a) Propadiene (b) Propylene

(c) Acetylchloride (d) Acetone

29. The correct increasing order of the reactivity of halides for S_{N^1} reaction is

(a) $CH_3 - CH_3 - X < (CH_3)_2CH - X < CH_2 = CH - CH_2 - X < PhCH_2 - X$

(b) $(CH_3)_2CH - X < CH_3 - CH_2 - X < CH_2 = CH - CH_2X < PhCH_2 - X$

(c) $PhCH_2 - X < (CH_3)_2\ CH - X < CH_3 - CH_2 - X < CH_2 = CH - CH_2 - X$

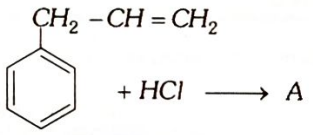
(d) $CH_2 = CH - CH_2 - X < Ph - CH_2 - X < (CH_3)_2CH - X < CH_3 - CH_2 - X$

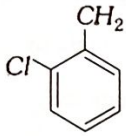
30. The position of Br in the compound in $CH_3CH = CHC(Br)(CH_3)_2$ can be classified as.....

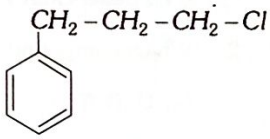
(a) Allyl (b) Aryl

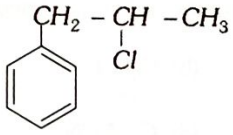
(c) Vinyl (d) Secondary

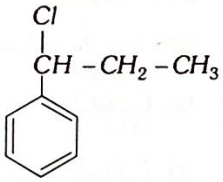
31. What is '*A*' in the following reaction



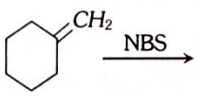
(a) 

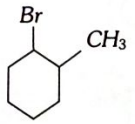
(b) 

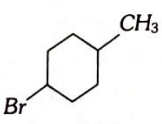
(c) 

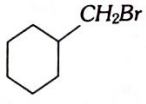
(d) 

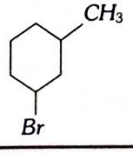
32. What will be the product in the following reaction

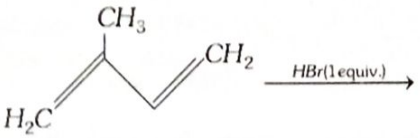


(a) 

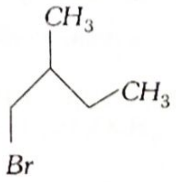
(b) 

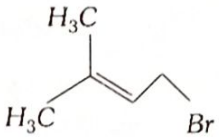
(c) 

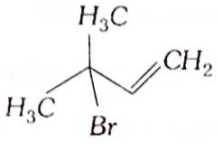
(d) 

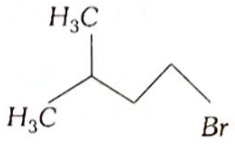
33. 

The major product of the above reaction is

(a) 

(b) 

(c) 

(d) 

34. When but -3-*en* -2- *ol* reacts with *aq. HBr*, the product formed is

(a) 3-bromobut-1-ene

(b) 1-bromobut-2-ene

(c) A mixture of both (a) and (b)

(d) 2-bromobut-2-ene

4. Haloarenes

1. Chlorobenzene is prepared commercially by

(a) Raschig process (b) Wurtz Fittig reaction

(c) Friedel-Craft's reaction (d) Grignard reaction

2. Which compound needs chloral in its synthesis

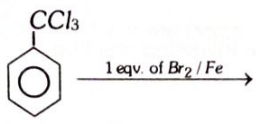
(a) D. D. T. (b) Gammexane

(c) Chloroform (d) Michler's ketone

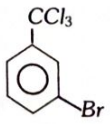
3. Which of the following is not formed by sandmeyer reaction

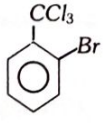
(a) C_6H_5Cl (b) C_6H_5I

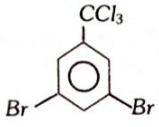
(c) C_6H_5Br (d) C_6H_5CN

4. 

A. Compound A is

(a) 

(b) 

(c) 

(d) 

5. Following equation illustrates

$$C_6H_5Cl + 2NaOH \xrightarrow[200\,atm]{200-250^oC} C_6H_5ONa + NaCl + H_2O$$

(a) Dow's process (b) Kolbe's process

(c) Carbylamine test (d) Haloform reaction

6. Aryl halide is less reactive than alkyl halide towards nucleophilic substitution because

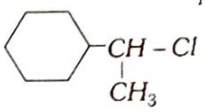
(a) Less stable carbonium ion

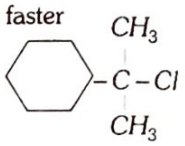
(b) Due to large $C-Cl$ bond energy

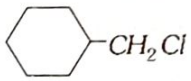
(c) Inductive effect

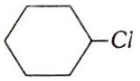
(d) Resonance stabilization and sp^2 - hybridisation of C attached to halide

7. Which will undergo S_{N^2} reaction faster

(a) 

(b) 

(c) 

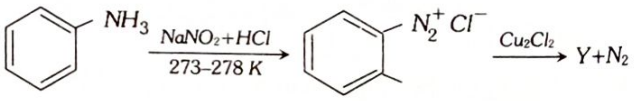
(d) 

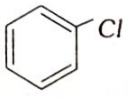
8. The $C-Cl$ bond in chlorobenzene as compared with $C-Cl$ bond in methyl chloride is

(a) Longer and weaker (b) Shorter and weaker

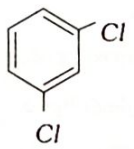
(c) Shorter and stronger (d) Longer and stronger

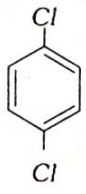
9. Identify the compound Y in the following reaction



(a) 

(b) 

(c) 

(d) 

10. 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

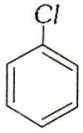
(b) Electrophilic substitution reaction

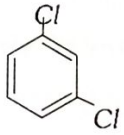
(c) Free radical addition reaction

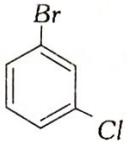
(d) Nucleophilic substitution reaction

11. Arrange the following compounds in the increasing order of their densities

(i) 

(ii) 

(iii) 

(iv) 

(a) (i) < (ii) <(iii) < (iv) (b) (i) < (iii) < (iv) < (ii)

(c) (iv) < (iii) < (ii) < (i) (d) (ii) < (iv) < (iii) < (i)

12. Full name of DDT is

(a) 1, 1, 1-trichloro-2, 2-*bis*(*p*-chlorophenyl) ethane

(b) 1, 1-dichloro-2, 2-diphenyl trimethylethane

(c) 1, 1-dichloro-2, 2-diphenyl trichloroethane

(d) None of these

13. 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

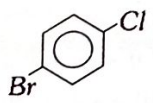
(d) Chlorobenzene > propyl chloride > methyl chloride

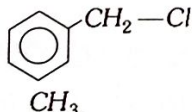
14. The bad smelling substance formed by the action of alcoholic caustic potash on chloroform and aniline is

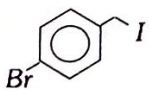
(a) Phenyl isocyanide (b) Nitrobenzene

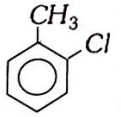
(c) Phenyl cyanide (d) Phenyl isocyanate

15. Which of the following will give yellow precipitate on shaking with an aqueous solution of $NaOH$ followed by acidification with dil. HNO_3 and addition of $AgNO_3$ solution

(a) 

(b) 

(c) 

(d) 

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

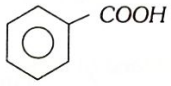
(a) Vinyl chloride, chlorethane, chlorobenzene

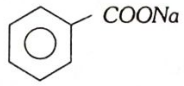
(b) Vinyl chloride, chlorobenzene, chloroethane

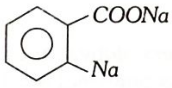
(c) Chloroethane, chlorobenzene, vinyl chloride

(d) Chlorobenzene, vinyl chloride, chloroethane

17. Toluene reacts with excess of Cl_2 in presence of sunlight to give a product which on hydrolysis followed by reaction with $NaOH$ gives

(a) 

(b) 

(c) 

(d) None of these

18. Which of the following statements about benzyl chloride is incorrect

(a) It is less reactive than alkyl halides

(b) It can be oxidised to benzaldehyde by boiling with copper nitrate solution

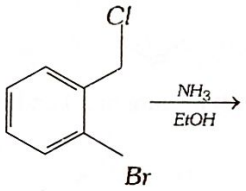
(c) It is a lachrymatory liquid and answers Beilstein's test

(d) It gives a white precipitate with alcoholic silver nitrate

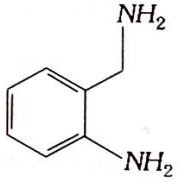
19. Which of the following is most reactive towards hydrolysis

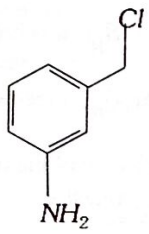
(a) $CH_2=CH-Cl$ (b) $CH_2=CH-CH_2-Cl$

(c) C_6H_5Cl (d) $C_6H_5CH_2Cl$

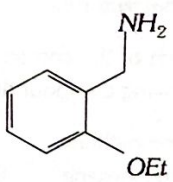
20. 

The product of the above reaction is

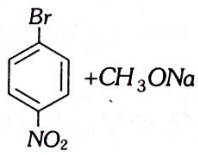
(a) 

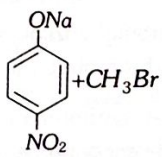
(b) 

(c) 

(d) 

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

(A) 

(B) 

(a) A (b) B

(c) Both A and B (d) None of these

22. 1 , 2-di-bromo cyclohexane on dehydrohalogenation gives

(a)  (b) 

(c)  (d) None of these

23. Which one of the following possess highest m.pt.

(a) Chlorobenzene (b) *o*-dichlorobenzene

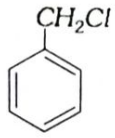
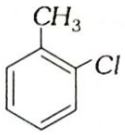
(c) *m*-dichlorobenzene (d) *p*-dichlorobenzene

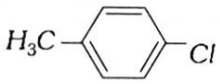
24. Chlorobenzene is formed by reaction of chlorine with benzene in the presence of $AlCl_3$. Which of the following species attacks the benzene ring in this reaction

(a) Cl^- (b) Cl^+

(c) $AlCl_3$ (d) $[AlCl_4]^-$

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

(a)  (b) 

(c)  (d) Mixture of (b) and (c)

26. Reaction of $C_6H_5CH_2Br$ with aqueous sodium hydroxide follows .....

(a) S_{N^1} mechanism

(b) S_{N^2} mechanism

(c) Any of the above two depending upon the temperature of reaction

(d) Saytzeff rule

27. Which of the correct increasing order of boiling points of the following compounds

1-bromoethane, 1-bromopropane, 1-bromobutane, Bromobenzene

(a) Bromobenzene < 1-bromobutane < 1-bromopropane < 1-bromoethane

(b) Bromobenzene < 1-bromoethane < 1-bromopropane < 1-bromobutane

(c) 1-bromopropane < 1-bromobutane < 1-bromoethane < Bromobenzene

(d) 1-bromoethane < 1-bromopropane < 1-bromobutane < Bromobenzene

28. An organic halide is shaken with aqueous $NaOH$ followed by the addition of dil. HNO_3 and silver nitrate solution gave silver mirror. The substance can be

(a) $C_6H_4(CH_3)Br$ (b) $C_6H_5CH_2Cl$

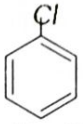
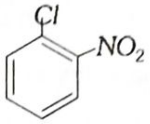
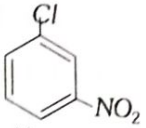
(c) C_6H_5Cl (d) None of these

29. $C_6H_6Cl_6$, on treatment with alcoholic KOH, yields

(a) C_6H_6 (b) $C_6H_3Cl_3$

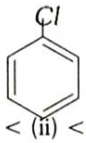
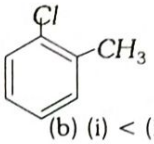
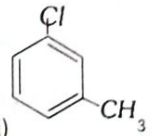
(c) $(C_6H_6)OH$ (d) $C_6H_6Cl_4$

Directions (Q. Nos. 30-33) In the questions 30 to 33 arrange the compounds in increasing order of rate of reaction towards nucleophilic substitution

30. (i)  (ii)  (iii) 

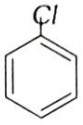
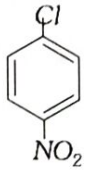
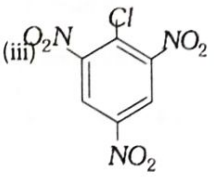
(a) (i) < (ii) < (iii) (b) (iii) < (ii) < (i)

(c) (i) < (iii) < (ii) (d) (iii) < (i) < (ii)

31. (i)  (ii)  (iii) 

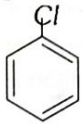
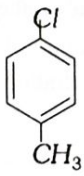
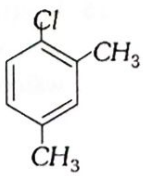
(a) (i) < (ii) < (iii) (b) (i) < (iii) < (ii)

(c) (iii) < (ii) < (i) (d) (ii) < (iii) < (i)

32. (i)  (ii)  (iii) 

(a) (iii) < (ii) < (i) (b) (ii) < (iii) < (i)

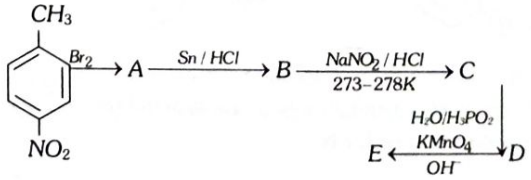
(c) (i) < (iii) < (ii) (d) (i) < (ii) < (iii)

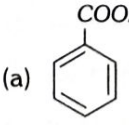
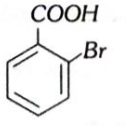
33. (i)  (ii)  (iii) 

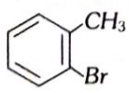
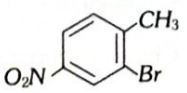
(a) (i) < (ii) < (iii) (b) (ii) < (i) < (iii)

(c) (iii) < (ii) < (i) (d) (i) < (iii) < (ii)

34. Identify the product (E) in the following sequence of reactions



(a)  (b) 

(c)  (d) 

5. Uses of Halogen Containing Compounds

1. CCl_4 and freons

   (a) Are green compounds because they are green coloured

   (b) Depletes ozone concentration

   (c) Causes increase in ozone concentration

   (d) Have no effect on ozone concentration

2. Which plastic is obtained from $CHCl_3$ as follows

$$CHCl_3 \xrightarrow[SbF_3]{HF} X \xrightarrow{800^\circ C} Y \xrightarrow{Polymerisation} \text{Plastic}$$

   (a) Bakelite (b) Teflon

   (c) Polythene (d) Perspex

3. Iodoform can be used as

   (a) Anaesthetic (b) Antiseptic

   (c) Analgesic (d) Antifebrin

4. In fire extinguisher, pyrene is

   (a) CO_2 (b) CCl_4

   (c) CS_2 (d) $CHCl_3$

5. CCl_4 is well known fire extinguisher. However, after using it to extinguish fire, the room should be well ventilated. This is because

   (a) It is flammable at higher temperatures

   (b) It is toxic

   (c) It produces phosgene by reaction with water vapour at higher temperatures

   (d) It is corrosive

   (e) It is anaesthetic

6. Match the **list I** and **list II** and pick the correct matching from the codes given below

List I (Halo alkane/arene)	**List II (Applications)**
(A) Iodoform	1. CF_4
(B) BHC	2. Antiseptic
(C) Freon–14	3. Moth repellent
(D) Halothanes	4. Inhalative anaesthetic
(E) *p*–dichlorobenzene	5. Termite pesticide

   (a) $A-2; B-4; C-5; D-3, E-1$

   (b) $A-2; B-5; C-1; D-4; E-3$

   (c) $A-3; B-4; C-2; D-1; E-5$

   (d) $A-1; B-3; C-5; D-2; E-4$

   (e) $A-5$; B – 4; $C-3; D-2; E-1$

6. Different Halogen Derivatives of Hydrocarbons

1. Among the following, one with the highest percentage of chlorine is

   (a) Chloral (b) Pyrene

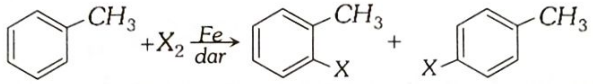
   (c) PVC (d) Gammexane

2. Which of the following is halogen exchange reaction

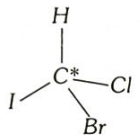
   (a) $RX + NaI \rightarrow RI + NaX$

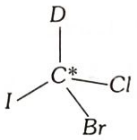
   (b) $>C=C< + HX \longrightarrow >C(H)-C(X)<$

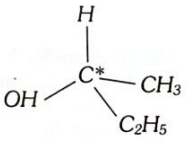
   (c) $R-OH + HX \xrightarrow{ZnCl_2} R-X + H_2O$

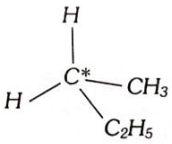
   (d) 

3. In which of the following molecules, carbon atom marked with asterisk (*) is asymmetric

   (i) 

   (ii) 

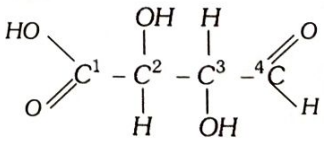
   (ii) 

   (iv) 

   (a) (i), (ii), (iii) and (iv) (b) (i), (ii) and (iii)

   (c) (ii), (iii) and (iv) (d) (i), (iii) and (iv)

4. Which of the carbon atoms present in the molecule given below are asymmetric



   (a) 1, 2, 3, 4 (b) 2, 3

   (c) 1, 4 (d) 1, 2, 3

5. Chlorine reacts with ethanol to give

   (a) Ethyl chloride (b) Chloroform

   (c) Acetaldehyde (d) Chloral

6. On heating diethyl ether with conc. HI, 2 moles of which of the following is formed

   (a) Ethanol (b) Iodoform

   (c) Ethyl iodide (d) Methyl iodide

7. Which of the following compound will make precipitate most readily with $AgNO_3$

(a) CCl_3CHO (b) $CHCl_3$

(c) $C_6H_5CH_2Cl$ (d) CHI_3

8. Which Chloride is least reactive with the hydrolysis point of view

(a) CH_3Cl (b) CH_3CH_2Cl

(c) $(CH_3)_3CCl$ (d) $CH_2=CH-Cl$

9. In the following reaction X is

$CH_3NH_2 + X + KOH \rightarrow CH_3NC$ (highly offensive odour)

(a) CH_2Cl_2 (b) $CHCl_3$

(c) CH_3Cl (d) CCl_4

10. Which of the following compounds does not undergo nucleophilic substitution reactions

(a) Vinyl chloride (b) Ethyl bromide

(c) Benzyl chloride (d) Isopropyl chloride

7. IIT-JEE/ AIEEE

1. The synthesis of alkyl fluorides is best accomplished by **[2015]**

(a) Free radical fluorination (b) Sandmeyer's reaction

(c) Finkelstein reaction (d) Swarts reaction

2. 2-chloro-2-methylpentane on reaction with sodium methoxide in methanol yields

(A) $C_2H_5CH_2\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}}-OCH_3$ (B) $C_2H_5CH_2\underset{\underset{CH_3}{|}}{C}=CH_2$

(C) $C_2H_5CH_2=\underset{\underset{CH_3}{|}}{C}-CH_3$

[2016]

(a) (A) and (C) (b) (C) only

(c) (A) and (B) (d) All of these

3. 1-chlorobutane reacts with alcoholic KOH to form **[1991]**

(a) 1-butene (b) 2-butane

(c) 1-butanol (d) 2-butanol

4. The order of reactivities of the following alkyl halides for a S_{N^2} reaction is **[2000]**

(a) $RF > RCl > RBr > RI$ (b) $RF > RBr > RCl > RI$

(c) $RCl > RBr > RF > RI$ (d) $RI > RBr > RCl > RF$

5. The organic chloro compound, which shows complete stereochemical inversion during a S_{N^2} reaction, is **[2008]**

(a) $(CH_3)_3CCl$ (b) $(CH_3)_2CHCl$

(c) CH_3Cl (d) $(C_2H_5)_2CHCl$

6. Ethyl bromide reacts with silver nitrite to form **[1991]**

(a) Nitroethane

(b) Nitroethane and ethyl nitrite

(c) Ethyl nitrite

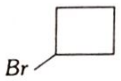
(d) Ethane

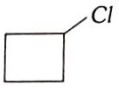
7. Alkyl halides react with dialkyl copper lithium reagents to give **[2005]**

(a) Alkenes (b) Alkyl copper halides

(c) Alkanes (d) Alkenyl halides

8. What would be the product formed when 1-Bromo-3-chloro cyclobutane reacts with two equivalents of metallic sodium in ether **[2005]**

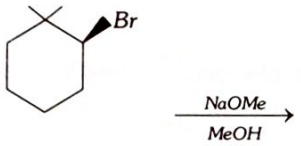
(a) 

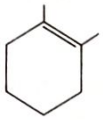
(b) 

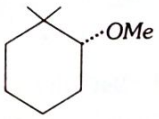
(c) 

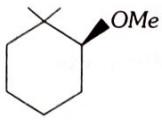
(d) 

9. The major product of the following reaction is **[2005]**



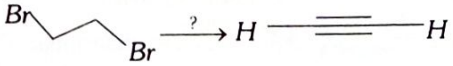
(a) 

(b) 

(c) 

(d) 

10. The reagent(s) for the following conversion,



is/are **[2007]**

(a) Alcoholic KOH

(b) Alcoholic KOH followed by $NaNH_2$

(c) Aqueous KOH followed by $NaNH_2$

(d) Zn/CH_3OH

11. Which compound does not form iodoform with alkali and iodine **[1985]**

(a) Acetone (b) Ethanol

(c) Diethyl ketone (d) Isopropyl alcohol

12. Iodoform can be prepared from all except **[2012]**

(a) Ethyl methyl ketone (b) Isopropyl alcohol

(c) 3-methyl–2–butanone (d) Isobutyl alcohol

13. In the preparation of chlorobenzene from aniline, the most suitable reagent is **[1984]**

(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

14. The compound formed on heating chlorobenzene with chloral in the presence of concentrated sulphuric acid, is **[2004]**

(a) Freon (b) DDT

(c) Gammexane (d) Hexachloroethane

15. Bottles containing C_6H_5I and $C_6H_5CH_2I$ lost their original labels. They were labelled *A* and *B* for testing. *A* and *B* were separately taken in test tubes 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* give a yellow precipitate. Which one of the following statements is true for this experiment **[2003]**

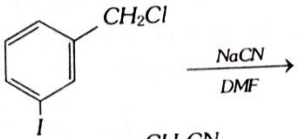
(a) A was C_6H_5I

(b) A was $C_6H_5CH_2I$

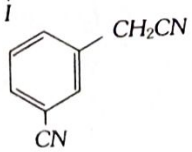
(c) B was C_6H_5I

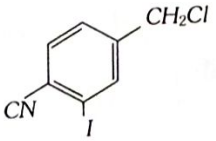
(d) Addition of HNO_3 was unnecessary

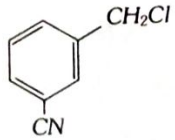
16. The structure of the major product formed in the following reaction

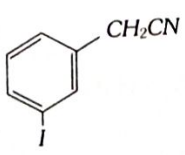
is 

[2006]

(a) 

(b) 

(c) 

(d) 

17. Fluorobenzene (C_6H_5F) can be synthesized in the laboratory **[2006]**

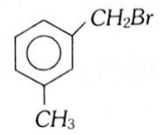
(a) By heating phenol with *HF* and *KF*

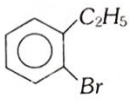
(b) Form aniline by diazotisation following by heating the diazonium salt with HBF_4

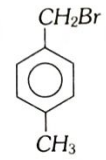
(c) By direct fluorination of benzene with F_2 gas

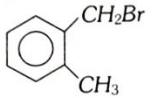
(d) By reacting bromobenzene with *NaF* solution

18. Compound (A), C_8H_9Br, gives a white precipitate when warmed with alcoholic $AgNO_3$. Oxidation of (A) gives an acid (B), $C_8H_6O_4$. (B) easily forms anhydride on heating. Identify the compound (A) **[2013]**

(a) 

(b) 

(c) 

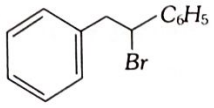
(d) 

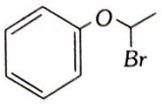
19. Reaction of *trans* 2-phenyl-1-bromocyclopentane on reaction with alcoholic *KOH* produces **[2006]**

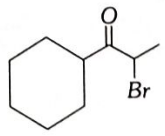
(a) 4-phenylcyclopentene (b) 2-phenylcyclopentene

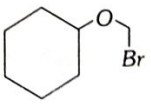
(c) 1-phenylcyclopentene (d) 3-phenylcyclopentene

20. Which of the following, upon treatment with tert-BuONa followed by addition of bromine water, fails to decolourise the colour of bromine **[2017]**

(a) 

(b) 

(c) 

(d) 

8. NEET/ AIPMT/ CBSE-PMT

1. When ethyl alcohol (C_2H_5OH) reacts with thionyl chloride, in the presence of pyridine, the product obtained is **[2001]**

(a) $CH_3CH_2Cl + HCl$

(b) $C_2H_5Cl + HCl + SO_2$

(c) $CH_3CH_2Cl + H_2O + SO_2$

(d) $CH_3COCl + HCl + SO_2$

2. Which of the following reaction (s) can be used for the preparation of alkyl halides

(I) $CH_3CH_2OH + HCl \xrightarrow{anh.ZnCl_2}$

(II) $CH_3CH_2OH + HCl \longrightarrow$

(III) $(CH_3)_3COH + HCl \longrightarrow$

(IV) $(CH_3)_2CHOH + HCl \xrightarrow{anh.ZnCl_2}$ **[2015]**

(a) (I), (III) and (IV) only (b) (I) and (II) only

(c) (IV) only (d) (III) and (IV) only

3. Which one is most reactive towards S_{N^1} reaction **[2010]**

(a) $C_6H_5CH_2Br$ (b) $C_6H_5CH(C_6H_5)Br$

(c) $C_6H_5CH(CH_3)Br$ (d) $C_6H_5C(CH_3)(C_6H_5)Br$

4. In the following sequence of reactions $CH_3-Br \xrightarrow{KCN} A \xrightarrow{H_3\overset{+}{O}} B \xrightarrow{LiAlH_4} C$, the end product ($C$) is **[2012]**

(a) Acetone (b) Methane

(c) Acetaldehyde (d) Ethyl alcohol

5. Reaction of *t*-butyl bromide with sodium methoxide produces **[1994]**

(a) Isobutane (b) Isobutylene

(c) Sodium *t*-butoxide (d) *t*-butyl methyl ether

6. 2-bromopentane is heated with potassium hydroxide in ethanol. The major product obtained is **[1998]**

(a) Pentene-1 (b) *cis* pentene-2

(c) *trans* pentene-2 (d) 2-ethoxypentane

7. Consider the reaction

$CH_3CH_2CH_2Br + NaCN \rightarrow CH_3CH_2CH_2CN + NaBr$

This reaction will be the fastest in **[2016]**

(a) Water

(b) Ethanol

(c) Methanol

(d) N,N'-dimethylformamide (DMF)

8. When $CH_3CH_2CHCl_2$ is treated with $NaNH_2$, the product formed is **[2002]**

(a) $CH_3-CH=CH_2$ (b) $CH_3-C\equiv CH$

(c) $CH_3CH_2CH(NH_2)(Cl)$ (d) $CH_3CH_2C(NH_2)_2$

9. Which of the following is obtained when chloral is boiled with $NaOH$ **[1991]**

(a) CH_3Cl (b) $CHCl_3$

(c) CCl_4 (d) None of these

10. When chloroform is exposed to air and sunlight, it gives **[1990]**

(a) Carbon tetrachloride (b) Carbonyl chloride

(c) Mustard gas (d) Lewsite

11. Chloropicrin is obtained by the reaction of **[2004]**

(a) Chlorine on picric acid

(b) Nitric acid on chloroform

(c) Steam on carbon tetrachloride

(d) Nitric acid on chlorobenzene

12. Phenol reacts with $CHCl_3$ and $NaOH$ (at $340K$) to give **[2002]**

(a) *o*-chlorophenol (b) Salicylaldehyde

(c) Benzaldehyde (d) Chlorobenzene

13. What happens when CCl_4 is treated with $AgNO_3$ **[1988]**

(a) NO_2 will be evolved

(b) A white ppt. of $AgCl$ will be formed

(c) CCl_4 will dissolve in $AgNO_3$

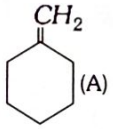
(d) Nothing will happen

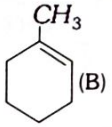
14. If we use pyrene (CCl_4) in the Riemer-Tiemann reaction in place of chloroform, the product formed is **[1989]**

(a) Salicylaldehyde (b) Phenolphthalein

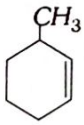
(c) Salicylic acid (d) Cyclohexanol

15. In the reaction with HCl, an alkene reacts in accordance with the Markovnikov's rule, to give a product 1-chloro-1-methylcyclohexane. The possible alkene is **[2015]**

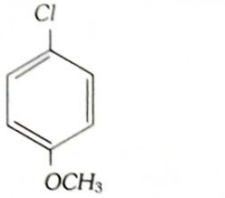
(a)  (A)

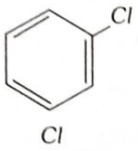
(b)  (B)

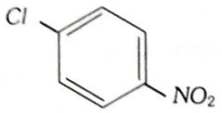
(c) (A) and (B)

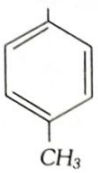
(d) 

16. Which of the following compounds undergoes nucleophilic substitution reaction most easily **[2011]**

(a) 

(b) 

(c) 

(d) 

17. In the following reaction $C_6H_5CH_2Br \xrightarrow[2.\ H_3O^+]{1.\ Mg,Ether} X$, the product 'X' is **[2010]**

(a) $C_6H_5CH_2OCH_2C_6H_5$ (b) $C_6H_5CH_2OH$

(c) $C_6H_5CH_3$ (d) $C_6H_5CH_2CH_2C_6H_5$

18. Replacement of Cl of chlorobenzene to give phenol requires drastic conditions but chlorine of 2, 4-dinitrochlorobenzene is readily replaced because **[1997]**

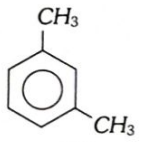
(a) NO_2 make ring electron rich at ortho and para

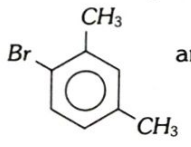
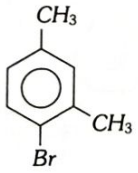
(b) NO_2 withdraws e^- from meta position

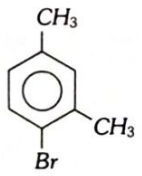
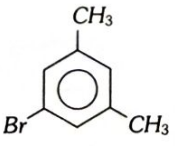
(c) $-NO_2$ donates e^- at meta position

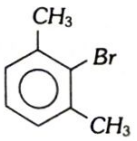
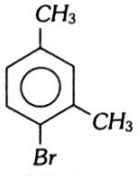
(d) NO_2 withdraws e^- from ortho/para positions

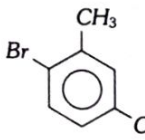
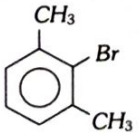
19. What products are formed when the following compound is treated with Br_2 in the presence of $FeBr_3$ **[2014]**



(a)  and 

(b)  and 

(c)  and 

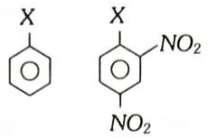
(d)  and 

20. Which of the following can be used as the halide component for Friedal – Crafts reaction **[2016]**

(a) Isopropyl chloride (b) Chlorobenzene

(c) Bromobenzene (d) Chloroethene

21. The correct order of increasing reactivity of C–X bond towards nucleophile in the following compounds is



(I) (II) $(CH_3)_3C-X$ (III) $(CH_3)_2CH-X$ (IV)

[2010]

(a) III < II < I < IV (b) I < II < IV < III

(c) II < III < I < IV (d) IV < III < I < II

22. Freon (dichlorodifluoro methane) is used **[2001]**

(a) As local anaesthetic

(b) For dissolving impurities in metallurgical process

(c) In refrigerator

(d) In printing industry

23. A compound A has a molecular formula C_2Cl_3OH. It reduces Fehling solution and on oxidation gives a monocarboxylic acid (B). A is obtained by action of chlorine on ethyl alcohol. A is **[1994]**

(a) Chloral (b) $CHCl_3$

(c) CH_3Cl (d) Chloroacetic acid

9. AIIMS

1. The following reaction is known as

$$C_2H_5OH + SOCl_2 \xrightarrow{\text{Pyridine}} C_2H_5Cl + SO_2 + HCl$$ **[2002]**

(a) Kharasch effect

(b) Darzen's procedure

(c) Williamson's synthesis

(d) Hunsdiecker synthesis reaction

2. Decreasing order of reactivity of HX in the reaction $ROH + HX \rightarrow RX + H_2O$ **[1983]**

(a) $HI > HBr > HCl > HF$ (b) $HBr > HCl > HI > HF$

(c) $HCl > HBr > HI > HF$ (d) $HF > HBr > HCl > HI$

3. Which of the following is a primary halide **[2008]**

(a) Isopropyl iodide (b) Secondary butyl iodide

(c) Tertiary butyl bromide (d) Neo hexyl chloride

4. Treatment of ammonia with excess of ethyl chloride will yield **[1992]**

(a) Diethyl amine

(b) Ethane

(c) Tetraethyl ammonium chloride

(d) Methyl amine

5. Which of the following compounds has the highest boiling point **[2006]**

(a) $CH_3CH_2CH_2Cl$ (b) $CH_3CH_2CH_2CH_2Cl$

(c) $CH_3CH(CH_3)\,CH_2Cl$ (d) $(CH_3)_3C\,Cl$

6. An alkyl halide may be converted into an alcohol by **[2001]**

(a) Addition (b) Substitution

(c) Dehydrohalogenation (d) Elimination

7. Identify Z in the following series

$$C_2H_5I \xrightarrow{\text{Alco. KOH}} X \xrightarrow{Br_2} Y \xrightarrow{KCN} Z$$ **[1983]**

(a) CH_3CH_2CN (b) $\begin{matrix} CH_2CN \\ | \\ CH_2CN \end{matrix}$

(c) $BrCH_2 - CH_2CN$ (d) $BrCH = CHCN$

8. The major product formed in the following reaction is

$$CH_3-\underset{\underset{H}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2\,Br \xrightarrow[CH_3OH]{CH_3O^-}$$ **[2005]**

(a) $CH_3-\underset{\underset{H}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2OCH_3$ (b) $CH_3-\underset{\underset{OCH_3}{|}}{CH}-CH_2CH_3$

(c) $CH_3-\overset{\overset{CH_3}{|}}{C}=CH_2$ (d) $CH_3-\underset{\underset{OCH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_3$

9. The product formed on reaction of ethyl alcohol with bleaching powder is **[1991]**

(a) $CHCl_3$ (b) CCl_3CHO

(c) CH_3COCH_3 (d) CH_3CHO

10. A sample of chloroform being used as anaesthetic is tested by **[1980]**

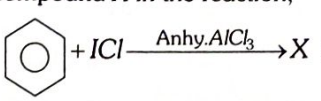
(a) Fehling solution

(b) Ammoniacal Cu_2Cl_2

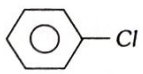
(c) $AgNO_3$ solution

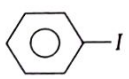
(d) $AgNO_3$ solution after boiling with alcoholic KOH solution

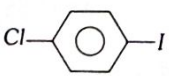
11. The compound X in the reaction,

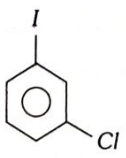


[2007]

(a) 

(b) 

(c) 

(d) 

12. Among the following, the one which reacts most readily with ethanol is **[2004]**

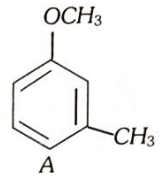
(a) p-nitrobenzyl bromide

(b) p-chlorobenzyl bromide

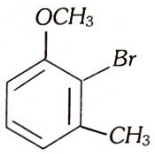
(c) p-methoxybenzyl bromide

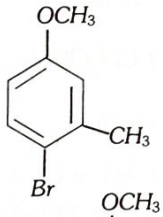
(d) p-methylbenzyl bromide

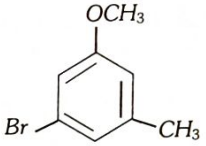
13. The major product obtained on the monobromination (with $Br_2/FeBr_3$) of the following compound A

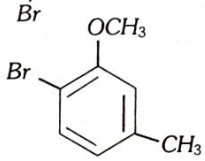


$\xrightarrow[2.\,heat]{1.\,Br_2/NaOH}$ is **[2006]**

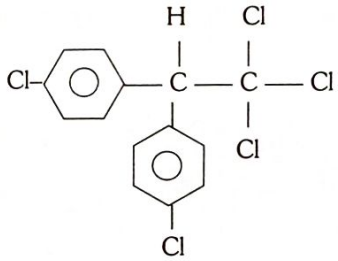
(a) 

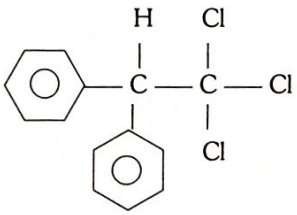
(b) 

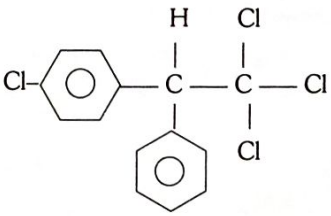
(c) 

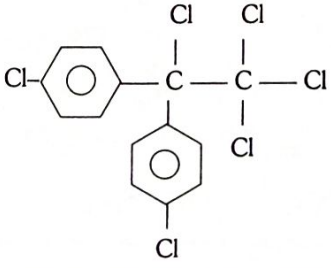
(d) 

14. Which one of the following is the correct formula of dichlorodiphenyl trichloroethane **[1982]**

(a) 

(b) 

(c) 

(d) 

15. Among the following the most reactive towards alcoholic KOH is **[2004, 15]**

(a) $CH_2 = CHBr$ (b) $CH_3COCH_2CH_2Br$

(c) CH_3CH_2Br (d) $CH_3CH_2CH_2Br$ b

10. Assertion and reason

Read the assertion and reason carefully to mark the correct option out of the options given below:

(a) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(b) If both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) If assertion is true but reason is false.

(d) If the assertion and reason both are false.

(e) If assertion is false but reason is true.

1. Assertion : $CHCl_3$ is stored in transparent bottles.

Reason : $CHCl_3$ is oxidised in dark. **[AIIMS 1996]**

2. Assertion : Nucleophilic substitution reaction on an optically active alkyl halide gives a mixture of enantiomers.

Reason : The reaction occurs by S_{N^1} mechanism.

3. Assertion : Electron withdrawing groups in aryl halides decrease the reactivity towards nucleophilic substitution.

Reason : 2, 4-Dinitrochlorobenzene is less reactive than chlorobenzene.

4. Assertion : Addition of Br_2 to cis-but-2-ene is stereoselective.

Reason : S_{N^2} reactions are stereospecific as well as stereoselective.

5. Assertion : Optically active 2-iodobutane on treatment with NaI in acetone undergoes racemization.

Reason : Repeated Walden inversions on the reactant and its product eventually gives a racemic mixture.

28. Haloalkanes and Haloarenes – Answers Keys

1. Preparation of Alkyl Halides

1	d	2	a	3	a	4	c	5	c
6	c								

2. Properties of Alkyl Halides

1	a	2	a	3	b	4	a	5	c
6	b	7	b	8	d	9	c	10	b
11	c	12	b	13	b	14	b	15	d
16	a	17	c	18	a	19	c	20	a
21	a	22	c	23	a	24	c	25	c
26	c	27	d	28	a	29	b	30	c
31	c	32	d	33	b	34	d	35	b
36	c	37	a	38	d	39	a	40	e
41	e	42	a	43	a				

3. Dihalides, Trihalides, Tetrahalides, Unsaturated Halides

1	b	2	a	3	b	4	c	5	d
6	c	7	b	8	a	9	a	10	a
11	a	12	b	13	a	14	c	15	a
16	d	17	c	18	c	19	c	20	b
21	a	22	d	23	d	24	a	25	b
26	b	27	a	28	a	29	a	30	a
31	c	32	a	33	b	34	c		

4. Haloarenes

1	a	2	a	3	b	4	a	5	a
6	d	7	c	8	c	9	a	10	b
11	a	12	a	13	a	14	a	15	c
16	d	17	b	18	a	19	d	20	c
21	c	22	a	23	d	24	b	25	d
26	a	27	d	28	b	29	b	30	c
31	d	32	d	33	c	34	b		

5. Uses of Halogen Containing Compounds

1	b	2	b	3	b	4	b	5	c
6	b								

6. Different Halogen Derivatives of Hydrocarbons

1	b	2	a	3	b	4	b	5	d
6	c	7	d	8	d	9	b	10	a

7. IIT-JEE/ AIEEE

1	d	2	d	3	a	4	d	5	c
6	a	7	c	8	d	9	d	10	b
11	c	12	d	13	c	14	b	15	a
16	d	17	b	18	d	19	d	20	d

8. NEET/ AIPMT/ CBSE-PMT

1	b	2	a	3	d	4	d	5	b
6	c	7	d	8	b	9	b	10	b
11	b	12	b	13	d	14	c	15	c
16	c	17	c	18	d	19	a	20	a
21	b	22	c	23	a				

9. AIIMS

1	b	2	a	3	d	4	c	5	b
6	b	7	b	8	d	9	a	10	c
11	b	12	c	13	b	14	a	15	b

10. Assertion & Reason

1	d	2	a	3	d	4	b	5	a