CHEMISTRY

BOOKS - TARGET CHEMISTRY (HINGLISH)

HALOGEN DERIVATIVES OF ALKANES AND ARENES

Classical Thinking

1. When one or more hydrogen atoms of an aromatic hydrocarbon are replaced by the corresponding number of halogen atoms, the resulting compound are called as

A. halogen derivatives of alkanes

B. halogen derivatives of alkenes

C. halogen derivatives of alkynes

D. halogen derivatives of arenes

Answer: D

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2. Alkyl halides are used as _____.

A. refrigerants

B. dry cleaning agents

C. insecticides

D. all of these

Answer: D

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3. Halogen derivatives of alkanes are classified according to _____.

A. the nature of the halogen group present in the molecule

B. the number of halogen atoms in the molecule

C. the number of pi bonds in the molecule

D. the number of carbon atoms in the molecule

Answer: B

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4. Haloforms are trihalogen derivatives of _____.

A. C_2H_6

B. CH_4

C. C_3H_8

D. C_2H_4

Answer: B

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5. The general molecular formula of alkyl halides are types of _____ derivatives of alkyl halides.

A. R-X-R

B. $C_nH_{2n}X_2$

C. $C_nH_{2n}X$

D. $C_nH_{2n+1}X$

Answer: D

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6. Primary, secondary and tertiary of alkyl halides is _____.

A. monohalogen

B. dihalogen

C. trihalogen

D. tetrahalogen

Answer: A

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

A. $C_6H_5CHClCH_3$

B. $CH_3CHClCH_2CH_3$

C. $(CH_3)_2CHCH_2Cl$

D. $(CH_3)_3CCl$

Answer: C

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8. Which of the following is a 2° alkyl halide ?

A. Isopropyl chloride

B. Isobutyl chloride

C. n-Propyl chloride

D. n-Butyl chloride

Answer: A

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9. tert-Butyl bromide can be written as _____.

A. $(CH_3)_3CBr$

B. $(Ch_3)_2CH_2 - CH_2Br$

C. $(CH_3)_2CHBr - CH_3$

D. $(CH_3)_3Br$

Answer: A

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10. The compound $H-\overset{\overset{H}{|}}{\underset{\underset{H}{|}}{C}}-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}}-Cl$ has its IUPAC name as _____ .

A. 1-Chloro-1, 1-dimethylhexane

B. 2-Chloro-2-methylpropane

C. tert-Butyl chloride

D. 2-Methyl-2-propyl chloride

Answer: B

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11. IUPAC name of $C_2H_5-Ch_2-\underset{\underset{C_2H_5}{|}}{C}\ Br-CH_3$ is _____.

A. 3-Bromo-3-methylhexane

B. 3-Bromo-2-methylpropane

C. 2-Ethyl-3-bromopentane

D. 2-Bromo-3-ethylpentane

Answer: A

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12. Isobutyl chloride in IUPAC is named as _____.

A. 1-Chloro-2-methylbutane

B. 1-Chloro-2-methylpropane

C. 2-Chlorobutane

D. 2-Chloro-2-methylpropane

Answer: B

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13. In $CH_3 - CH_2 - CH_2Br, C - Br$ bond is formed by the overlapping of _____.

A. $2sp^3 - 2p_z$

B. $2sp^3 - 3p_z$

C. $3sp^3 - 3p_z$

D. $2sp^3 - 4p_z$

Answer: D

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14. Chlorination of an alkane takes place , in the presence of _____.

A. infrared light

B. diffused sunlight

C. $\gamma - rays$

D. β-rays

Answer: B

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15. Alkanes CANNOT be directly iodinated because_____.

A. the reaction is too slow

B. the reaction is reversible

C. I_2 is a weak reagent

D. alkanes do not react with I_2

Answer: B

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16. Iodination of an alkane is carried out in presence of

A. acts as a source of iodine

B. acts as an oxidising agent

C. acts as a reducing agent

D. promotes energy of the iodine molecules

Answer: B

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17. According to Markownikoff's rule, negative part of the reagent is added , to that carbon atom of alkene_____.

A. which carried lesser number of carbon atoms

B. which carries more number of hydrogen atoms

C. which carried lesser number of hydrogen atoms

D. which carries no hydrogen atoms

Answer: C

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18. The product of the reaction

But-2-ene+$NBr \rightarrow$?

A. $CH_3CHBrCH_2CH_3$

B. $Ch_3CH_2CHBrCH_3$

C. $CH_2BrCH_2CH_2CH_3$

D. both (A) and (B)

Answer: D

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19. $A + HBr \rightarrow C_5H_{11}Br$. A is most likely to be an _____.

A. alkane

B. alkene

C. alkyne

D. arene

Answer: B

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20. Anti-Markownikoff's addition of HBr takes place in the presence of _____.

A. $CaCO_3$

B. NaOH

C. H_2O_2

D. HCl

Answer: C

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21. But-1-ene reacts with HBr in the presence of peroxide and forms _____.

A. $(CH_3)_3C - Br$

B. $CH_3 - CHBrC_2H_5$

C. $CH_3 - CH_2 - CH_2 - CH_2 - Br$

D. $(CH_3)_2CH - CH_2 - Br$

Answer: C

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22. Which of the following reaction is Anti-Markownikoff's addition ?

A. $CH_3CH = CH_2 + HBr \xrightarrow{\text{peroxide}} CH_3CHBr - CH_3$

B. $CH_3CH = CH_2 + HBr \xrightarrow{\text{peroxide}} CH_3CH_2CH_2Br$

C. $CH_3CH = CH_2 + HCl \xrightarrow{\text{peroxide}} CH_3CH_2CH_2Cl$

D. Both (B) and (C)

Answer: B

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23. The reaction is ,

$R - CH_2 - OH + HCl \rightarrow R - CH_2 - Cl + H_2O$. For the completion of the reaction , _____ is used .

A. conc. H_2SO_4

B. $CaCl_2$

C. excess of water

D. anhydrous $ZnCl_2$

Answer: D

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24. When ethanol is treated with potassium bromide and concentrated H_2SO_4, _____ is produced.

A. ethyl bromide

B. ethyl hydrogen sulphate

C. ethylene

D. ethane

Answer: A

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25. The reaction of phosphorus tribromide with ethanol gives_____.

A. monohalogen derivative

B. dihalogen derivative

C. bromine gas

D. alkene

Answer: A

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26. In the reaction ,

$X + PCl_5 \xrightarrow{\Delta} CH_3CH_2Cl + POCl_3$, X is _____.

A. ethanol

B. ethanal

C. ethane

D. methane

Answer: A

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27. Ethyl alcohol on treating with thionyl chloride gives off which gas ?

A. Cl_2

B. C_2H_6

C. SO_3

D. SO_2

Answer: D

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28. $C_3H_8 + CI_2 \xrightarrow{Light} C_3H_7CI + HCI$ is an example of which of the following types of reactions ?

A. Substitution

B. Elimination

C. Addition

D. Rearrangement

Answer: A

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29. Best method of preapring alkyl chloride is

A. $ROH + SOCl_2 \rightarrow$

B. $ROH + PCl_5 \rightarrow$

C. $ROH + PCl_3 \rightarrow$

D. $ROH + HCl \xrightarrow{\text{anhydrous } ZnCl_2}$

Answer: D

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30. Alkyl halides are_____ in nature.

A. polar

B. non-polar

C. ionic

D. acidic

Answer: A

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31. For a given alkyl group , the boiling points of alkyl halides follow the order:

A. $RI > RBr > RCl$

B. $RCl > RBr > RI$

C. $RI > RCl > RBr$

D. $RBr > RI > RCl$

Answer: A

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32. Which of the following alkyl chloride will have the least boiling point ?

A. Ethyl chloride

B. Propyl chloride

C. Butyl chloride

D. Methyl chloride

Answer: D

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33. Which of the following statement is WRONG ?

A. Lower alkyl halides are either colourless gases or volatile liquids.

B. Alkyl halides are completely soluble in water and in organic solvents.

C. In case of isomeric alkyl halides, the boiling point decreases with increase in branching.

D. The higher alkyl halides are colourless solids.

Answer: B

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34. Which of the following statement is FALSE for alkyl halides ?

A. They are less reactive by nature.

B. They give nucleophilic substitution reactions.

C. The halide group is easily replaced by different functional groups.

D. All of these

Answer: A

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35. The reactivity of alkyl halides depend upon _____.

A. the nature of halogen atom

B. the nature of alkyl group

C. both (A) and (B)

D. none of these

Answer: C

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36. Conversion of an alkyl halide to alcohol can be done by _____.

A. oxidation

B. hydration

C. alkaline hydrolysis

D. acidic hydrolysis

Answer: C

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37. What is formed by the following reaction ?

$R - X + AgOH \xrightarrow{moist Ag_2O} R - OH +$_____.

A. AgOH

B. H_2O

C. AgX

D. Ag_2O

Answer: C

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38. Butanenitrile may be prepared by heating

A. $CH_3CH_2CH_2OH$ and KNO_3

B. $CH_3CH_2CH_2Cl$ and KCN

C. $CH_3CH_2CH_2CH_2OH$ and KCN

D. $CH_3CH_2CH_2CH_2Cl$ and KNO_3

Answer: B

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39. Which of the following compounds has an offensive odour ?

A. R-NC

B. R-CN

C. R-O-Na

D. R-O-R

Answer: A

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40. To get alkyl isocyanide from alkyl halide, the latter is heated with _____.

A. aq. KCN

B. AgCN

C. alc. KCN

D. All of these

Answer: B

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41. The reaction of ammonia with methyl chloride in the presence of alcoholic KOH is called _____ reaction.

A. ammonolysis

B. hydrolysis

C. isocyanide

D. Wurtz

Answer: A

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42. When C_2H_5Br is treated with excess amount of alcoholic NH_3 the major product obtained is _____.

A. ethylamine

B. diethylamine

C. triethylamine

D. tetraethyl ammonium bromide

Answer: A

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43. When sodium salt of ethanol is treated with ethyl bromide, the product formed is :

A. methoxyethane

B. ethoxymethane

C. diethyl ketone

D. diethyl ether

Answer: D

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44. Methyl bromide on reacting with silver acetate gives _____.

A. acetic acid

B. acetyl chloride

C. methyl acetate

D. acetaldehyde

Answer: C

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45. Isopropyl bromide when heated with alcoholic KOH gives propene. The reaction is _____.

A. Substitution

B. Elimination

C. Addition

D. cyclisation

Answer: B

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46. Dehydrohalogenation is a process in which _____.

A. hydrogen is removed and halogen is added.

B. both hydrogen and halogen are removed

C. dehalogenation occurs in presence of hydrogen

D. dehydration occurs in the presence of halogen

Answer: B

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47. n-Propyl bromide on treatment with ethanolic potassium hydroxide produces _____.

A. propanal

B. propene

C. propyne

D. propanol

Answer: B

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48. Treatment of sec-butyl bromide with alcoholic KOH forms_____.

A. but-1-ene only

B. but-2-ene only

C. butan-2-ol

D. a mixture of but-1-ene and but-2-ene

Answer: D

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49. It is easier to prepare alkenes by dehydrohalogenation of _____.

A. alkyl bromide

B. alkyl iodine

C. alkyl chloride

D. alkyl fluoride

Answer: B

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50. In elimination reaction, H atoms from adjacent carbon atoms, having less number of hydrogen atom is preferentially removed. This behaviour is ruled by _____.

A. Markownikoff's rule

B. Saytzeff's rule

C. Williamson's synthesis

D. peroxide effect

Answer: B

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51. Which one is an organometallic compound ?

A. C_2H_5COOAg

B. C_2H_5Ona

C. C_2H_5MgBr

D. $(CH_3COO)_2Ca$

Answer: C

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52. Alkyl halides can be converted into Grignard reagent by _____.

A. boiling them with magnesium ribbon in alcoholic solution

B. warming them with magnesium powder in dry ether

C. warming them with $MgCl_2$

D. refluxing them with $MgCl_2$ solution

Answer: B

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53. When n-butyl magnesium bromide is treated with water, the product is _____.

A. isobutane

B. n-butane

C. n-butyl alcohol

D. isobutyl alcohol

Answer: B

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54. Alkyl halides are used for the preparation of _____.

A. alkanes

B. alkenes

C. alcohols

D. All of these

Answer: D

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55. A ray of light consisting of a single wavelength vibrating in all planes perpendicular to the direction of propagation is called_____.

A. plane polarized

B. polarized light

C. monochromatic light

D. ultraviolet light

Answer: C

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56. Ordinary light is converted into plane polarized light by passing through a _____.

A. nickel prism

B. glass prism

C. Nicol prism

D. glass slab

Answer: C

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57. The property by virtue of which a compound can rotate plane polarized light is known as

A. photolysis

B. phosphorescence

C. optical activity

D. polarization

Answer: C

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58. d- and l-forms of an optically active compound differ in_____.

A. boiling points

B. melting points

C. specific rotation

D. specific gravity

Answer: C

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59. Wherever an optically active compound is prepared in the laboratory, the product formed in most of the cases is a _____.

A. basic mixture

B. racemic mixture

C. homogeneous mixture

D. true mixture

Answer: B

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60. A molecule is said to be chiral if it_____.

A. contains a plane of symmetry

B. contains a centre of symmetry

C. cannot be superimposed on its mirror image

D. exists as cis-trans isomers

Answer: C

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61. Which of the following letter is chiral ?

A. M

B. O

C. V

D. P

Answer: D

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62. The necessary and sufficient condition for a molecule to exhibit optical activity is _____.

A. molecular symmetry

B. molecular asymmetry or chirality

C. presence of unsaturated carbon atoms

D. tetrahedral nature of carbon atoms

Answer: B

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63. Lactic acid is a classical example of _____.

A. position isomerism

B. geometrical isomerism

C. optical isomerism

D. chain isomerism

Answer: C

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64. Which of the following halide is capable of exhibiting enantiomerism ?

A. Ethyl chlorine

B. Isopropyl bromide

C. sec-Butyl iodine

D. tert-Butyl chloride

Answer: C

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65. Molecularity of the reaction is determined by _____.

A. one molecule

B. two molecule

C. three molecules

D. total number of molecules in R.D.S(Rate determining step)

Answer: D

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66. Which of the reaction are most common in alkyl halides

A. Nucleophilic substitution

B. Nucleophilic addition

C. Electrophilic addition

D. Electrophilic substitution

Answer: A

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67. In S_N2 mechanism, the rate of reaction is proportional to concentration of _____.

A. only substrate

B. only reagent

C. both substrate and reagent

D. electrophile

Answer: C

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68. Amongst the following , which is/are TRUE for S_N2 reaction ?

A. The rate of reaction is independent of the concentration of the nucleophile.

B. The nucleophile attacks the carbon atom on the side of the molecule opposite to the group beig displaced

C. The reaction proceeds with simultaneous bond formation and bond rupture.

D. Both (B) and (C)

Answer: D

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69. Transition state is defined as the state of a reaction , which contains_____.

A. minimum energy

B. maximum energy

C. zero energy

D. Kinetic energy

Answer: B

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70. Which one of the following compounds most readily undergoes substitution by S_N2 mechanism ?

A. $CH_3 - CH_2 - Cl$

B. $(CH_3)_2CH - Cl$

C. $CH_3 - \underset{\displaystyle C_2H_5}{\overset{\displaystyle CH_3}{\underset{|}{\overset{|}{CH}}}} - Cl$

D. $CH_3 - \underset{\displaystyle C_2H_5}{\overset{\displaystyle CH_3}{\underset{|}{\overset{|}{C}}}} - Cl$

Answer: C

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71. The S_N1 mechanism for the hydrolysis of an alkyl halide to an alcohol involves the formation of _____.

A. carbonium ion

B. pentavalent carbon in the transition state

C. carbanion

D. free radical

Answer: A

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72. During S_N1 reaction mechanism of alkyl halides, the change observed is _____.

A. retention of confriguration

B. inversion of confriguration

C. both retention and inversion of confriguration

D. retention of geometry

Answer: C

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73. The reactivity of various types of alkyl halides towards S_N1 reaction is _____.

A. primary $>$ secondary $>$ tertiary

B. secondary $>$ primary $>$ tertiary

C. tertiary $>$ secondary $>$ primary

D. secondary $>$ tertiry $>$ primary

Answer: C

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74. S_N1 reaction is favoured by _____.

A. non-polar solvents

B. bulky groups on the carbon atom attached to the halogen atom

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

D. strong nucleophile

Answer: B

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75. An optically active halide when allowed to react with CN^- gives a racemic mixture. The halide is most likely to be _____.

A. primary

B. secondary

C. tertiary

D. quaternary

Answer: C

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76. Racemisation takes place in S_N1 reaction. The reason is _____.

A. inversion of configuration

B. retention of configuration

C. both inversion and retention of the configuration

D. neither inversion nor retention of the configuration

Answer: C

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77. Aromatic compounds have_____.

A. pleasant smell

B. unpleasant smell

C. no smell

D. smell of rotten eggs

Answer: A

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78. When four or more halogen atoms are attached to an aromatic ring, the compound is classified as_____.

A. monohaloarene

B. dihaloarene

C. trihaloarene

D. polyhaloarene

Answer: D

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79. Which of the following is an aryl halide ?

A. 

B. 

C. 

D. 

Answer: C

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80. In aryl halide , halogen atom is attached _____.

A. to a carbon atom of benzene ring

B. to a carbon atom of side chain

C. to both benzene ring and side chain

D. none of these

Answer: A

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81. Which of the following contain sp^2 hybridised carbon bonded to X?

A. 

B. 

C. $CH_3 = CH - CH_2 - X$

D. 

Answer: D

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82. 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

Answer: C

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83. The weakest C-Cl bond is present in _____.

A. 

B. 

C. 

D. 

Answer: D

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84. Arenes when treated with chlorine or bromine in the presence of Lewis acid as a catalyst undergo_____reaction.

A. Nucleophilic substitution

B. electrophilic substitution

C. rearrangement

D. dehydrohalogenation

Answer: B

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85. o-Chlorotoluene and p-Chlorotoluene can be easily seperated _____.

A. as there is a large difference in their melting point

B. as they occur in different states

C. as they do not form hydrogen bonds

D. by diffusion

Answer: A

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86. Chlorobenzene is generally obtained from a corresponding diazonium salt by reacting it with _____.

A. $CuCl_2$

B. $CuSO_4$

C. Cu

D. $Cu(NH_3)_4^{2+}$

Answer: A

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87. The product formed when benzenediazonium chloride is treated with CuBr/HBr is_____.

A. bromobenzene

B. chlorobenzene

C. 1,3-dibromobenzene

D. 1,4-dichlorobenzene

Answer: A

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88. Aryl halides are less reactive towards nucleophilic substitution reaction as compared to alyl halides due to

A. the formation of less stable carbonium ion

B. lesser s-character of bond

C. longer carbon -halogen bond

D. sp^2-hybridized carbon attached to halogen

Answer: D

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89. A permanent effect in carbon chain compounds in which electrons forming a bond between a carbon atom and another atom are partially displaced towards the atom with greatest electronegatively , is called_____.

A. inert pair effect

B. resonance

C. inductive effect

D. peroxide effect

Answer: C

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90. The effect in which atoms or groups in a compounds can push away the electrons is called _____ effect.

A. $-I$

B. $+I$

C. mesomeric

D. electromeric

Answer: B

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91. Resonance occurs due to the :

A. identical arrangement of atoms

B. delocalisation of pi-electrons

C. migration of H-atom

D. migration of protons

Answer: B

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92. Chlorobenzene when heated with a mixture of concentrated H_2SO_4 and concentrated HNO_3 yeilds_____ as a major product.

A. 

B. 

C. 

D. 

Answer: B

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93. Chlorobenzene on treatment with concentrated sulphuric acids yeilds H_2O and_____.

A. 

B. 

C. both (A) and (B)

D. none of these

Answer: C

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94. Introduction of alkyl or aryl group in chlorobenzene by reacting it with methyl chloride in the presence of anhydrous aluminium chloride is known as _____.

A. Sandmeyer reaction

B. Wurtz-Fitting reaction

C. Williamson's synthesis

D. Friedel-craft reaction

Answer: D

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95. Aryl halides undergo _____.

A. Wurtz-Fitting reaction

B. Friedel craft reaction

C. Sulphonation reaction

D. all of the above reactions

Answer: D

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96. Which one was/is used as a fumigant pesticide ?

A. CH_4

B. CH_3Cl

C. CH_2Cl_2

D. $CHCl_3$

Answer: C

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97. $\mathbb{C}l_4$ is also used as a _____.

A. fertilizer

B. antiseptic

C. dry-cleaning agent

D. paint remover

Answer: C

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98. Which of the following compound has antiseptic property ?

A. CHI_3

B. CH_2Cl_2

C. $CHCl_3$

D. $\mathbb{C}l_4$

Answer: B

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99. Alkanes can be iodinated only in the presence of _____.

A. HgO

B. HI

C. HgO_2

D. H_2O_2

Answer: A

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100. Ethyl isocyanide can be prepared when ethyl iodide reacts with _____.

A. silver cyanide

B. potassium cyanide

C. cyanogen gas

D. hydrogen cyanide

Answer: D

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101. In dehydrohalogenation reaction, the conversion that takes place is _____.

A. alkene to haloalkane

B. haloalkane to alkene

C. alcohol to alkene

D. alkene to alcohol

Answer: B

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102. Ethyl chloride reacts with sodium in dry ether to form butane. The reaction is named as _____reaction.

A. Rosenmund

B. Fittig

C. Wurtz

D. Clemmensen

Answer: A

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103. Both methane and ethane can be prepared in one step from _____.

A. C_2H_4

B. CH_3OH

C. CH_3Br

D. CH_3CH_2OH

Answer: B

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104. An alkyl halide after forming the corresponding Grignard reagent and heating with water yeilds propane. What is the original alkyl halide ?

A. n-Propyl halide

B. n-Butyl halide

C. Ethyl halide

D. Methyl halide

Answer: D

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105. $(CH_3)_2C(Cl)CH_2CH_3$ and $(CH_3)_2CHCH(Cl)CH_3$ are _____ isomers of each other.

A. chain

B. position

C. geometrical

D. metamers

Answer: B

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106. The method of seperation of racemic mixture into dextro and laevo isomers is known as _____.

A. asymmetric synthesis

B. resolution

C. racemisation

D. polarization

Answer: B

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107. Which of the following is used to measure the optical activity ?

A. Chemical tests

B. Polarimeter

C. Spectroscope

D. Potentiometer

Answer: A

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108. During heterolytic fission , which species retain shared pair of electron ?

A. Less electronegative element

B. More electronegative element

C. Electropositive element

D. Either (A) or (C)

Answer: B

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109. The species containing carbon with three bonds and an electron, are called _____.

A. free radicals

B. carbonium ions

C. carbanions

D. carboxylate ions

Answer: A

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110. An example for a nucleophile is

A. OH^-

B. $\dot{N}H_3$

C. $R - C \equiv N$

D. All of these

Answer: D

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111. Inductive effect does NOT operate in _____.

A. HF

B. F_2

C. CH_3Cl

D. CH_3COOH

Answer: B

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112. When 1-phenyl-2-chloropropane, is heated with alcoholic KOH, the product is _____.

A. 1-phenylpropene

B. 2-phenylpropene

C. 1-phenylpropan-2-ol

D. 1-phenylpropan-1-ol

Answer: A

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

A. silver cyanide

B. potassium cyanide

C. hydrogen cyanide

D. ammonia

Answer: B

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114. An excess of ethyl chloride reacts with NH_3 to give_____.

A. 3° amine

B. 2° amine

C. 1° amine

D. quaternary ammonium salt

Answer: D

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115. Alcoholic KOH can be effectively utilized for _____.

A. dehydrogenation

B. dehydrohalogenation

C. dehalogenation

D. dehydration

Answer: B

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116. When 2-bromo-2-methylbutane is heated with alcoholic KOH, the possible products are _____.

$(i)(CH_3)_2 = CHCH_3$

(ii) $CH_2 - \underset{\underset{CH_3}{|}}{C} - CH_2CH_3$

$(iii)(CH_3)_2CH - CH = CH_2$

A. (i),(iii)

B. (i),(ii)

C. (ii),(iii)

D. (i),(ii),(iii)

Answer: B

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117. If ethyl bromide is refluxed with ether and magnesium then which of the following compound is formed ?

A. $C_2H_5 - MgBr$

B. $C_2H_5 - O - C_2H_5$

C. $C_2H_5 - Mg - C_2H_5$

D. none of these

Answer: A

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118. In a carbonium ion, the central carbon atom is _____.

A. positively charged

B. negatively charged

C. neutral

D. any of the above depending upon the other atoms present along with carbon

Answer: A

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Critical Thinking

1. Which of the following reactions will yeilds the product, than can be preferably used as solvent for the non-polar compounds ?

A. $Ch_3 - X + Na \xrightarrow[ether]{Dry} Product$

B. $C_2H_5 - CH = CH_2 + H_2 \xrightarrow{\text{Raney Ni}} Product$

C. $C_2H_5 - H + X_2 \rightarrow Product$

D. All of these

Answer: C

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2. If two halogen atoms are attached to same carbon atom of an alkane, it is called as _____.

A. alkyl halide

B. alkylene halide

C. alkylidene halide

D. aryl halide

Answer: C

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3. C_4H_9Br can represent

A. a 3° bromoalkane

B. a 2° bromoalkane

C. a 1° bromoalkane

D. all of these

Answer: D

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4. Among the following examples , 3° alkyl halide is _____.

A. $CH_3 - CH_2 - C(CH_3)_2$

B. 

C. $CH_3 - CH_2 - \underset{\underset{Cl}{|}}{CH} - C(CH_3)_3$

D. $CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{C}\ H - Cl$

Answer: A

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5. Which of the following is 3° chloride ?

A. $CH_3C(Cl)_3$

B. $(CH_3)_3C - CH_2Cl$

C. $(CH_3)_3C - Cl$

D. $CH_3CH_2 - CHCl - CH_3$

Answer: C

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6. IUPAC name of

$$C_2H_5 - \overset{\overset{C_2H_5}{|}}{C}H - \overset{\overset{Cl}{|}}{C}H - \overset{\overset{CH_3}{|}}{C}H - CH_2 - CH_2 - CH_3$$

A. 4-Chloro-3-ethyl-2-methylheptane

B. 4-Chloro-3-ethyl-5-methyloctane

C. 5-Chloro-6-ethyl-4-methyloctane

D. 4-Chloro-5-methyl-3-ethyloctane

Answer: B

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7. IUPAC name of $(CH_3)_3C - CH_2 - CHI - CH_3$ is

A. 2-Iodo-4,4-dimethylbutane

B. 4-Iodo-2,2-dimethylpentane

C. 2-Iodo-4,4-dimethylpentane

D. 3-Iodo-4,4-dimethylpentane

Answer: C

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8. IUPAC name of the compound

$(CH_3)_2CH - CH_2 - CH(C_2H_5 - CH(CH_3Cl$ is

A. 1-Chloro-2-ethyl-1,4,4-trimethylbutane

B. 3-Ethyl-5-methyl-2-chlorohexane

C. 2-Chloro-3-ethyl-5-methylhexane

D. 2-Chloro-2-methyl-6-ethylheptane

Answer: C

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9. The correct order of C–X bond polarity is:

A. $CH_3Br > CH_3Cl > CH_3I$

B. $CH_3I > CH_3Br > CH_3Cl$

C. $CH_3Cl > CH_3Br > CH_3I$

D. $CH_3Cl > CH_3I > CH_3Br$

Answer: C

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10. In the compound 'X', all the bond angles are exactly $109^\circ 28$. 'X' may be_____.

A. Chloroform

B. Iodoform

C. Chloromethane

D. Carbon tetrachloride

Answer: D

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11. Direct halogenation of alkane is NOT a suitable method for the preparation of alkyl halides because_____.

A. the reaction cannot be controlled

B. a mixture of mono, di, tri, and polyhalogen derivative is obtained ,which is difficult to separate

C. alkyl halides obtained are not pure

D. all of these

Answer: D

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12. Pent-1-ene+HCl toProduct. Major product in this reaction will be_____.

A. 3-Chloropentane

B. 2-Chloropentane

C. 1,2-Dichloropentane

D. 1-Chloropentane

Answer: B

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13. Isobutyl bromide may be obtained from isobutylene and HBr in the presence of _____.

A. peroxide

B. hydroquinone

C. pyridine

D. diffused sunlight

Answer: A

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14. Which of the following reagents CANNOT be used to prepare an alkyl halide from an alcohol ?

A. HCl+anhydrous $ZnCl_2$

B. PBr_3

C. NaCl

D. $SOCl_2$

Answer: C

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15. Amongst the following , HBr reacts fastest with _____.

A. 2-Methylpropan-2-ol

B. Propan-1-ol

C. Propan-2-ol

D. 2-Methylpropan-1-ol

Answer: A

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16. The solvent used in the conversion of alcohol to alkyl halide through $SOCl_2$ is _____.

A. pyridine

B. ether

C. chloroform

D. benzene

Answer: A

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17. Formation of an alkyl halide form an alkyl halide with change in halogen atom is nothing but a/an_____.

A. exchange reaction

B. replacement reaction

C. nucleophilic substitution

D. all of these

Answer: D

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18. Which of the following has highest boiling point ?

A. $CH_3 - CH_2 - CH_2 - CH_2 - Cl$

B. $CH_3 - CH_2 - \overset{CH_3}{\underset{|}{C}}\,H - Cl$

C. $CH_3 - CH_2 - \overset{CH_3}{\underset{|}{C}}\,H - Cl$

D. $H_3C - \overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}} - Cl$

Answer: A

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19. Which of the following alkyl halides has the lowest boiling point ?

A. $CH_3 - CH_2 - Br$

B. $CH_3 - (CH_2)_2 - CH_2Br$

C. $H_3C - \underset{\underset{CH_3}{|}}{C}\ H - Br$

D. CH_3Br

Answer: D

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20. $CHCl_3$ is a liquid while CHI_3 is a solid, because_____.

A. $CHCl_3$ is less polar than CHI_3

B. C-Cl bond is stronger than C-I bond

C. their shapes are different

D. the molecular weight of CHI_3 is greater than that of $CHCl_3$

Answer: D

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21. The conversion of alkyl halides to the corresponding alcohols is carried out in the presence of _____.

A. aq. KOH

B. aq. NaOH

C. moist Ag_2O

D. all of these

Answer: D

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22. The products formed when ethyl chloride is treated with silver cyanide, are _____.

A. $C_2H_5CN + AgCl$

B. $CH_3NC + AgCl$

C. $C_2H_5NC + AgCl$

D. $H_2C = CH_2 + HCN + AgCl$

Answer: C

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23. C_2H_5Br gives C_2H_5CN on reaction with alcoholic KCN, while with AgCN the major product is C_2H_5NC . The reason is _____.

A. AgCN is electrovalent

B. AgCN is more covalent

C. Ag is more electropositive as compared to K.

D. Ag is noble metal

Answer: B

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

A. primary and secondary amines

B. primary and tertiary amines

C. primary ,secondary and tertiary amines

D. primary,secondary,tertiary amines and the quanternary ammonium salts

Answer: D

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25. A carbon compound X forms Y with sodium metal. It also forms Z with PCl_5 but Y and Z react to form diethyl ether. Therefore X,Y and Z are respectively_____.

A. $C_2H_5OH, C_2H_5Ona, C_2H_5Cl$

B. $C_2H_5Cl, C_2H_5Ona, C_2H_5OH$

C. $C_2H_5OH, C_2H_6, C_2H_4Cl_2$

D. $C_2H_5OH, C_2H_5Cl, C_2H_6$

Answer: A

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26. When n-butyl chloride is treated with alcoholic potash, the main product formed is _____.

A. but-1-ene

B. n-butyl alcohol

C. but-2-ene

D. sec-butyl alcohol

Answer: A

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27. The compound obtained as the major product on refluxing 2-Chloro-2-methylbutane with alcoholic Koh solution is _____.

A. $CH_3 - CH = CHCH_3$

B. $(CH_3)_2C = CHCH_3$

C. $(CH_3)_2 - \underset{\underset{OH}{|}}{C} - CH_2 - CH_3$

D. $CH_3CH_2 - \underset{\underset{CH_3}{|}}{C} = CH_2$

Answer: B

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28. Wurtz synthesis is carried out by treating _____.

A. alkyl halide in dry ether with anhydrous sodium hydroxide

B. alkyl halide in dry ether with sodalime

C. alkyl halide in dry ether with sodium metal

D. alkyl halide in aqueous solution of sodium hydroxide

Answer: C

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29. Reaction with ethyl chloride with sodium leads to the formation of _____.

A. ethane

B. propane

C. n-butane

D. n-pentane

Answer: C

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30. A mixture of ethyl iodine methyl iodine undergo Wurtz reaction. The alkane/s obtained is/are_____.

A. C_4H_{10}

B. $C_3H\_(8)$

C. C_2H_6

D. all of these

Answer: D

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31. The alkane that is NOT formed isopropyl bromide and thyl bromide together or separately with sodium in ether is _____.

A. n-butane

B. 2,3-dimethylbutane

C. n-hexane

D. isopentane

Answer: C

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32. Which of the following reaction gives ethane ?

A. $C_2H_5Cl + Mg \xrightarrow{\text{dryether}}$

B. $C_2H_5Cl + LiAlH_4 \rightarrow$

C. $C_2H_5Cl + C_2H_5ONa \rightarrow$

D. $CHCl_3 \xrightarrow[\Delta]{\text{Ag powder}}$

Answer: B

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33. Gringnard reagents are obtained bu using dry reactants because _____.

A. Grignard reagent reacts with water to form carbonyl compound

B. Grignard reagent reacts with water to form alkane

C. Grignard reagent forms explosive mixture with water

D. Grignard reagent reacts with H_2O to form alcohol

Answer: B

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34. Which of these do not from Grignard reagent ?

A. CH_3F

B. CH_3Cl

C. CH_3Br

D. CH_3I

Answer: A

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35. $R - Mg - Br + H_2O \rightarrow RH_{(\text{gas})}$. Gas occupies 1.4 L g^{-1} of RH at S.T.P.

Hence , R-Mg-Br is _____ .

A. CH_3CH_2MgBr

B. C_6H_5MgBr

C. $CH_3CH_2CH_2MgBr$

D. CH_3MgBr

Answer: D

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36. Which among the following statement is WRONG about iodoethane ?

A. It reacts with alcoholic potassium cyanide to give ethyl cyanide.

B. It gives ethanol on treatment with moist Ag_2O

C. It reacts with Na in ether to give n-butane

D. with sodium methoxide , it gives diethyl ether.

Answer: D

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37. For a given substance the amount of rotation of plane of polarized light depends upon _____.

A. the number of molecules of the compound

B. the nature of light beam

C. specific rotation

D. number of asymmertric 'C' atoms in the molecule of substance

Answer: A

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38. A racemic mixtrue is optically inactive due to :

A. plane of symmetry

B. internal compensation

C. external compensation

D. non-chiral carbon

Answer: C

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39. Enantiomers_____.

A. are two optical isomers of a compound having different molecular formula

B. have same chemical properties

C. rotate the plane of the plane polarised light by unequal amount and in opposite direction.

D. have same rate of chemical reaction

Answer: B

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40. An organic compound will show optical isomerism if _____.

A. all groups attached to carbon atoms are same

B. four groups attached to carbon atoms are different

C. three groups attached to carbon atoms are different

D. two groups attached to carbon atoms are same

Answer: B

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41. Which of the following compound can exhibit enantiomerism ?

A. 

B. 

C. 

D. 

Answer: B

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42. Optical isomerism is exhibited by _____.

A. 1,2-dichloropropane

B. 1,1-dichloropropane

C. 2,2-dichloropropane

D. 1,3-dichloropropane

Answer: A

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43. About a racemic mixture, some statements are given below :

(i) It is amixture of (d) and (l) isomers in equimolar proportion.

(ii) It is a mixture of two optical isomers in equal proportions by weights.

(iii) It may be laevo-rotatory or dextro-rotatory

(iv) It rotates the plane of polarisation of light by equal angles on both the sides.

Among the following , the FALSE statements are _____.

A. only (ii),(iii) and (iv)

B. only (ii) and (iii)

C. only (iii) and (iv)

D. only (i) and (iii)

Answer: C

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44. Order of priorityof groups $OCOCH_3$, $COCH_3$ and $COOCH_3$ in R,S confriguration is _____.

A. $COOCH_3 > COCH_3 > OCOCH_3$

B. $OCOCH_3 > COOCH_3 > COCH_3$

C. $COCH_3 > COOCH_3 > OCOCH_3$

D. $OCOCH_3 > COCH_3 > COOCH_3$

Answer: B

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45. A nucleophile should possess_____.

A. an overall negative charge

B. an overall positive charge

C. a lone pair of electrons

D. an unpaired electron

Answer: C

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46. A nucleophile is:

A. Lewis acid

B. Lewis acid and also a Lewis base

C. Lewis base

D. neither a Lewis acid nor a Lewis base

Answer: C

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47. Which is NOT the correct statement/s for the nucleophilic reagents?

(i) They are electron loving species

(ii) They attack the positive centres as they are negatively charged.

(iii) They are Lewis acids.

(iv)They donate lone pair of electrons

A. (i) and (ii)

B. only (iii)

C. (i) and (iii)

D. All of these

Answer: C

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48. Substitution nucloephilic second order $[S_N 2]$ involves _____ steps(s).

A. one

B. two

C. three

D. four

Answer: A

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49. In alkaline hydrolysis of 1-bromopropane , _____.

A. reaction is endothermic

B. rate of reaction is independent of concentration of NaOH

C. rate of reaction is doubled , if concentration of any reactant is doubled.

D. rate of reaction is doubled as concentrations of both the reactants are doubled

Answer: C

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50. The optically active product obtained from S_N2 reaction of dextro rotatory compound will be _____.

A. dextro rotatory

B. laevo rotatory

C. racemic mixture

D. partially optically active

Answer: B

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51. Alkaline hydrolysis of a tertiary alkyl halide involve_____.

A. only one step

B. twp step

C. three steps

D. four steps

Answer: B

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52. In the alkaline hydrolysis of tert-butyl bromide_____.

A. Rate $=K\left[(CH_3\_(3)C-Br\right]\left[OH^-\right]$

B. Rate = $K\left[(CH_3\_(3)C-Br\right]+\left[OH^-\right]$

C. Rate = $K[(CH_3\_(3)C-Br]$

D. Rate= $K\left[OH^-\right]$

Answer: C

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53. In S_N1 reaction which of the following is TRUE?

A. Non-polar solvents favour S_N1 reaction.

B. Tertiary alkyl halide undergo S_N1 reaction.

C. The order of reactivity of alkyl halide is $1^\circ > 2^\circ > 3^\circ$.

D. δH is positive

Answer: B

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54. Which of the following statements is FALSE about S_N1 mechanism ?

A. It is a first order reaction.

B. It is favoured by higher concentration of the nucloephilic reagent.

C. It involves the formation of an intermediate.

D. It results into racemisation.

Answer: B

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55. Which of the following is TRUE for hydrolysis of an optically active tertiary halide ?

A. It is unimolecular as the overall reaction involves one molecules.

B. The product has 100% inversion of configuration

C. Reaction involves two steps, because order of reaction is one.

D. Formation of sp^2 carbon is slowest step.

Answer: D

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56. If starting compound is laevo rotatory , after the S_N1 reaction, product is _____.

A. Laevo rotatory

B. Dextro rotatory

C. recemic mixture

D. partially optically active

Answer: C

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57. Which among the following structure represents sym-trichlorobenzene?

A. 

B. 

C. 

D. 

Answer: B

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58. Chlorobenzene is .

A. less active than benzyl chloride

B. more reactive than ethyl bromide

C. nearly as reactive as methyl chloride

D. more reactive than isopropyl chloride

Answer: A

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59. Arrange the following compounds in order of increasing dipole moment:

(I) Toluene

(II) m-Dichlorobenzene

(III) o-Dichlorobemzene

(IV) p-Dichlorobenzene

A. $I < IV < II < III$

B. $IV < I < II < III$

C. $IV < I < III < II$

D. $IV < II < I < III$

Answer: B

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

A. Iodobenzene

B. chlorobenzene

C. Bromobenzene

D. Fluorobenzene

Answer: D

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61. Benzenediazonium salt when simply mixed with KI, gives off _____.

A. I_2

B. N_2

C. C_6H_6

D. Cl_2

Answer: B

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62. The phenomenon in which atoms or groups in a compound can attract electrons is called _____.

A. mesomeric effect

B. $+I$ effect

C. $-I$ effect

D. inert pair effect

Answer: C

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63. Example of species showing -I effect is _____.

A. NO_2

B. $-Cl$

C. $-COOH$

D. all of these

Answer: D

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64. It is easy to substitute $-Cl$ in 2,4-dinitrochlorobenzene than in chlorobenzene because _____.

A. Nitro group donates e^- at ortho/paraposition.

B. Nitro group withdraws e^- at metaposition

C. Nitro group donates e^- meta position

D. Nitro group donates e^- at ortho/para position

Answer: D

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65. In aryl halides , the reactivity is controlled by stronger_____ and 0. p orientation is controlled by weaker_____.

A. inductive effect, inductive effect

B. resonance effect, inductive effect

C. inductive effect, resonance effect

D. resonance effect , resonance effect

Answer: C

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66. Fridel-crafts' reaction of bromobenzene with methyl iodide gives

A. o-bromotoluene

B. p-bromotoluene

C. o- and p-bromotoluenes

D. m-bromotoluene

Answer: C

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67. The commercial uses of DDT and benzene hexachloride are _____.

A. DDT is a herbicide, benzene hexachloride is a fungicide.

B. both are used as insecticides

C. both are used as herbicides

D. DDT is a fungicide and benzene hexachloride is a herbicide

Answer: B

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68. Which of the following statement about DDT is FASLE ?

A. It is readily metabolized.

B. It is deposited and stored in fatty tissues.

C. It produces unforeseen ecological effects if it exists in soil , plants and animals for a long time.

D. It is replaced by better and safer infecticides

Answer: A

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69. Halogenation of alkanes is

A. a reductive process

B. an oxidative process

C. an isothermal process

D. an endothermic process

Answer: B

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70. $RC \equiv N$ can be converted to RCH_2NH_2 by _____.

A. reduction

B. hydrolysis

C. oxidation

D. nitration

Answer: A

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71. For the reaction, $C_2H_5OH + HX \xrightarrow{ZnCl_2} C_2H_5X + H_2O$, where HX is a halogen acid. The order of reactivity of halogen acids for their reaction is :

A. $HCl > HBr > HI$

B. $HBr > HI > HCl$

C. $HI > HCl > HBr$

D. $HI > HBr > HCl$

Answer: D

View Text Solution

72. The electron deficient reagents, which attack the negatively charged carbanions are called _____.

A. free radicals

B. electrophiles

C. nucleophiles

D. none of these

Answer: B

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73. Which of the following reactions does NOT show nucleophilic substitution of C_2H_5Br ?

A. $C_2H_5Br + 2H \rightarrow C_2H_6 + HBr$

B. $C_2H_5Br + KOH \rightarrow C_2H_5OH + KBr$

C. $C_2H_5Br + AgCN \rightarrow C_2H_5NC + AgBr$

D. $C_2H_5Br + C_2H_5Ona \rightarrow C_2H_5OC_2H_5$

Answer: A

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74. Heterolytic fission gives rise to _____.

A. charged species

B. electrophiles

C. nucleophiles

D. all of these

Answer: D

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75. Heterolysis of carbon-chlorine bond produces _____.

A. carbocation and chloride ion

B. two free radicals

C. carbonion and chloronium ion

D. two carbocations

Answer: A

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76. In alkaline hydrolysis of tert-Butyl bromide, _____.

A. rate of reaction is doubled as the concentration of the substrate is doubled

B. rate of reaction is halved as the concentration of any one of reactant is doubled

C. rate is doubles, as concentration of nucleophile is doubled

D. rate is independent of concentration of the reactants

Answer: A

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Competitive Thinking

1. The compound which contains all the four 1°,2°, 3° and 4° carbon atoms is

A. 2,3-dimethylpentane

B. 3-chloro-2,3-dimethylpentane

C. 2,3,3-trimethylpentane

D. 3,3-dimethylpentane

Answer: C

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2. Which of the following is the CORRECT order for strength of C-X bond ?

A. $CH_3F > CH_3Cl > CH_3Br > CH_3I$

B. $CH_3F > CH_3Cl > CH_3Br > CH_3I$

C. $CH_3I > CH_3F > CH_3Cl > CH_3Br$

D. $CH_3Cl > CH_3Br > CH_3F > CH_3I$

Answer: A

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3. Among the halomethanes , the C-X (X= halogen) bond energy increases in the order _____.

A. $CH_3F < CH_3Cl < CH_3Br < CH_3I$

B. $CH_3I < CH_3Br < CH_3Cl < CH_3F$

C. $CH_3F < CH_3Br < CH_3Cl < CH_3I$

D. $CH_3Cl < CH_3F < CH_3Br < CH_3I$

Answer: B

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4. Propene on treatment with HBr gives _____.

A. 1,2-dibromoethane

B. propyl bromide

C. isopropyl bromide

D. none of these

Answer: C

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5. This will give 2, 2-dibromopropane:

A. $CH \equiv CH + 2HBr$

B. $CH_3C \equiv CH + 2HBr$

C. $CH_3CH = CH_2 + HBr$

D. $CH_3 - CH_2 - CH = CH_2 + HBr$

Answer: B

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6. The product of the following reaction:

$CH_2 = Ch - \mathrm{CCl}_3 + HBr \rightarrow$ is _____.

A. $CH_3 - CH(Br) - CCl_3$

B. $CH_2(Br) - CH_2 - CCl_3$

C. $BrCH_2 - CHCl - CHCl_2$

D. $CH_3 - CH_2 - CCl_3$

Answer: A

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7. In the reaction with HCl, an alkene reacts in accordance with Markownikoff's rule to give a product 1-chloro-1-methylcyclohexane. The possible alkene is:

A. 

B. 

C. both (A) and (B)

D. 

Answer: C

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8. The reaction of $C_6H_5CH = CHCH_3$ with HBr produces :

A. $C_6H_5\underset{\underset{Br}{|}}{C}HCICH_3$

B. $C_6H_5CH_2\underset{\underset{Br}{|}}{C}HCH_3$

C. $C_6H_5CH_2CH_2CH_2Br$

D. 

Answer: A

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9. Which of the following acids adds to propene in the presence of peroxide to give anti-Markownikoff's product

A. HF

B. HCl

C. HBr

D. HI

Answer: C

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10. Peroxide effect is shown by _____.

A. $CH_2 = CH_2$

B. $CH_2 = CH - CH_3$

C. $CH_3 - CH = CH - CH_3$

D. $CH_3 - CH_2 - CH = CH - CH_2 - CH_3$

Answer: B

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11. $ROH + HX \rightarrow RX + H_2O$

In the above reaction , the reactivity of different alcohols is :

A. Tertiary $>$ Secondary $>$ Primary

B. Tertiary $>$ Secondary $>$ Primary

C. Teriary $>$ Secondary $>$ Primary

D. Secondary $>$ Primary $>$ Tertiary

Answer: A

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12. Decreasing order of reactivity of HX in the reaction

$ROH + HX \rightarrow RX + H_2O$

A. $HI > HBr > HCl > HF$

B. $HBr > HCl > HI > HF$

C. $HCl > HBr > HI > HF$

D. $HF > HBr > HCl > HI$

Answer: A

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13. Ethanol is converted into ethyl chloride by reacting with _____.

A. Cl_2

B. $SOCl_2$

C. HCl

D. NaCl

Answer: B

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14. When ethyl alcohol (C_2H_5OH) reacts with thionyl chloride, in the presence of pyridine, the product obtained is

A. $CH_3CH_2Cl + HCl$

B. $C_2H_5Cl + HCl + SO_2$

C. $CH_3CH_2Cl + H_2O + SO_2$

D. $CH_3COCl + HCl + SO_2$

Answer: B

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15. The conversion of ethyl bromide to ethyl iodine using sodium iodine and dry acetone is known as _____.

A. Swarts reaction

B. Finkelstein reaction

C. Sandmeyer reaction

D. Stephen reaction

Answer: B

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16. Name the following reaction:

$$CH_3CH_2Cl + NaI \xrightarrow{\text{Dry Acetone}} CH_3CH_2I + NaCl$$

A. Swarts reaction

B. Finkelstein reaction

C. Wurtz reaction

D. Hell-Volhard-Zelinsky reaction

Answer: B

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17. Which one is the Swarts reaction from the following ?

A. $CH_3Cl + NaI \xrightarrow{\text{Acetone}} CH_3I + NaCl$

B. $CH_3Br + NaI \xrightarrow{\text{Acetone}} CH_3I + NaBr$

C. $CH_3Br + AgF \rightarrow CH_3F + AgBr$

D. $2CH_3Cl + 2Na \xrightarrow{\text{Dry ether}} CH_3CH_3 + 2NaCl$

Answer: C

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18. Which of the following is liquid at room temperature

A. CH_3I

B. CH_3Br

C. C_2H_5Cl

D. CH_3F

Answer: A

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19. Among the following, the molecule with the highest dipole moment is :

A. CH_3Cl

B. CH_2Cl_2

C. $CHCl_3$

D. $\mathbb{C}l_4$

Answer: A

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20. Which of the following haloalkanes is most reactive?

A. 1-Chloropropane

B. 1-Bromopropane

C. 2-Chloropropane

D. 2-Bromopropane

Answer: D

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21. An alkyl halide may be converted into an alcohol by :

A. addition

B. substitution

C. dehydrohalogenation

D. elimination

Answer: B

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22. C_2H_5I and Ag_2O reacts to produce

A. C_2H_6

B. $C_2H_5 - C_2H_5$

C. $C_2H_5 - OH$

D. $C_2H_5 - CH_3$

Answer: C

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23. *[Math Processing Error]*. Y is this reaction is _____ .

A. 2-methylpropan-2-amine

B. 2-methylpropene

C. 2-amino-2-methylpropane

D. but-2-ene

Answer: C

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24. Treatment of ammonia with excess of ethyl chloride will yield

A. diethylamine

B. ethane

C. tetraethyl ammonium chloride

D. methylamine

Answer: C

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25. Williamson's synthesis is used for the preparation of _____.

A. acid

B. ester

C. ether

D. alcohol

Answer: C

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26. Reaction of $t - butyl$ bromide with sodium methoxide produces

A. isobutane

B. isobutylene

C. sodium tert-butoxide

D. tert-butyl methyl ether

Answer: B

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27. Which halide of formula C_4H_9I is capable of producing but -2-ene with alcoholic KOH solution ?

A. 1-Iodobutane

B. 2-Iodobutane

C. 1-Iodo-2-methylpropane

D. 2-Iodo-2-methylpropane

Answer: B

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28. In Wurtz reaction, alkyl halide reacts with _____.

A. Na in water

B. Na in ethereal solution

C. Na-Hg in water

D. Mg in ethereal solution

Answer: B

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

A. Butane

B. Octane

C. Hexane

D. Ethane

Answer: D

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30. An 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

Answer: C

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31. The order of reactivities of methyl halide in the formation of Grignard reagent is

A. $CH_3I > CH_3Br > CH_3Cl$

B. $CH_3Cl > CH_3Br > CH_3I$

C. $CH_3Br > CH_3Cl > CH_3I$

D. $CH_3Br > CH_3I > CH_3Cl$

Answer: A

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32. 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. $X = CH_3Cl, Y = AlC\frac{l_3}{H}Cl$

D. $X = CH_3NH_2, Y = HNO_2$

Answer: A

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33. What is the chemical composition of Nicol prism ?

A. Al_2O_3

B. $CaSO_4$

C. $CaCO_3$

D. Na_3AlF_6

Answer: C

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34. The number of asymmetric carbon atom/s in lactic acid is /are_____.

A. one

B. two

C. three

D. zero

Answer: A

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35. Two possible stereostructures of $CH_3CHOH.COOH$, which are optically active, are called:

A. enantiomers

B. mesomers

C. diastereomers

D. atropisomers

Answer: A

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36. Which of the following is an optically active compound ?

A. Butan-1-ol

B. Propan-1-ol

C. 2-Chlorobutane

D. 4-Hydroxyheptane

Answer: C

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

A. 2n

B. n^2

C. 2^n

D. 2n+2

Answer: C

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38. $(+2)$ 2-methylbutan -1-ol(-)2-methylbutan -1-of have different values for which

A. Boiling point

B. Relative density

C. Refractive index

D. Specific rotation

Answer: D

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39. Which among the following functional groups has been given the highest priority while assigning R-S configuration

A. $-C_6H_5$

B. $-CN$

C. $-C_2H_5$

D. $-CH_3$

Answer: B

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

A. $CONH_2 > COCH_3 > CH_2OH > CHO$

B. $CONH_2 > COCH_3 > CHO > CH_2OH$

C. $COCH_3 > CONH_2 > CHO > CH_2OH$

D. $CHO > CH_2OH > COCH_3 > CONH_2$

Answer: B

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

A. $-SO_3H$

B. $-COOH$

C. $-CHO$

D. $-C_6H_5$

Answer: A

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42. Which of the following halide is most reactive towards Nucleophilic substitution reactions ?

A. H_3C-CH_2-F

B. $H_3C - CH_2 - Cl$

C. $H_3C - CH_2 - Br$

D. $H_3C - CH_2 - I$

Answer: D

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43. Alkaline hydrolysis of CH_3Br with aqueous KOH is which order reaction /

A. 1^{st}

B. 2^{nd}

C. 3^{rd}

D. zero

Answer: B

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44. In S_N2 reaction_____.

A. the reaction is unimolecular

B. the reaction is favoured by weak nucleophile

C. carbonium ion is formed

D. polarity of solvent has no rule

Answer: D

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45. In S_N2 reactions, the correct order of reactivity for the following compounds:

$CH_3CI, CH_3CH_2CI, (CH_3)_2CHCI$ and $(CH_3)_2CCI$ is:

A. $CH_3Cl > (CH_3)_2CHCl > CH_3Cl_2Cl > (CH_3)_3\mathrm{C}Cl$

B. $CH_3Cl > CH_3CH_2Cl > (CH_3)_2CHCl > (CH_3)_3\mathrm{C}Cl$

C. $CH_3CH_2Cl > CH_3Cl > (CH_3)_2CHCl > (CH_3)_3CCl$

D. $(CH_3)_2CHCl > CH_3CH_2Cl > CH_3Cl > (CH_3)_3CCl$

Answer: B

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46. The CORRECT order of reactivity of the following iodides in S_N2 reaction is _____.

(i) $CH_3CH_2CH_2CH_2I$

(ii) $(CH_3)_3Cl$

$CH_3CH_2\underset{\underset{I}{|}}{C}HCH_3$

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

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

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

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

Answer: B

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47. Which of the following statement is INCORRECT for bimolecular nucleophilic substitution reaction S_N2 ?

A. It is a second order reaction.

B. In (S_N2) the substrate does not undergo heterolytic fission.

C. The rate of (S_N2) reaction does not depend on concentration of both substrate and nucleophilic reagent.

D. (S_N2) reaction occurs in single step without forming intermediate

Answer: C

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48. In alkaline hydrolysis of tert-butyl bromide , the order of reaction with respect to nucleophile is _____.

A. zero

B. first

C. pseudo

D. second

Answer: A

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49. Tertiary butyl bromide is hydrolysed by aqueous KOH . When the concentration of Koh is increased , the rate of reaction _____.

A. increases

B. decreases

C. remain the same

D. gets doubled

Answer: C

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50. Alkaline hydrolysis of which among the following compounds leads to the formation of a racemate ?

A. 1-Bromo-1-phenylethane

B. 1-chloro-3-methylbutane

C. Bromomethane

D. 1-Chloropropane

Answer: A

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51. The increasing order of the reactivity of the following halides for the S_N 1 reaction is

$$\underset{(I)}{CH_3CHCH_2CH_3}\quad \underset{(II)}{CH_3CH_2CH_2Cl}\quad \underset{(III)}{p-H_3CO-C_6H_4-CH_2C}$$

A. $III > II > I$

B. $II > I > III$

C. $I > III > II$

D. $II > III > I$

Answer: B

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52. The decreasing order of reactivity of the following compounds in S_N1 reactions is _____.

(i) $C_6H_5CH_2Br$ $(ii)C_6H_5CH(C_6H_5Br$

$(iii)C_6H_5CH(CH_3Br$ $(iv)C_6H_5C(CH_3)(C_6H_5)Br$

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

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

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

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

Answer: C

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53. Which of the following undergoes nucleophilic substitution exclusively by S_{N^1} mechanism?

A. Benzyl chloride

B. Ethyl chloride

C. Chlorobenzene

D. Isopropyl chloride

Answer: A

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54. Number of $\pi -$ bonds present in B.H.C. (Benzene hexachloride) are

A. 6

B. 0

C. 3

D. 12

Answer: B

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55. In case of R, S configuration the group having highest priority is

A. $-NO_2$

B. $-NH_2$

C. $-CN$

D. $-OH$

Answer: D

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56. Arenes on treatment with chlorine in presence of ferric chloride as a catalyst undergo what type of reaction ?

A. Electrophilic substitution

B. Nucleophilic substitution

C. Electrophilic addition

D. Nucleophilic addition

Answer: A

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57. The formula of phosgene is _____.

A. $COCl_2$

B. $POCl_3$

C. CH_3COCl

D. $POCl_2$

Answer: A

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58. Chloroform is kept in amber coloured bottles to prevent the formation of _____.

A. formaldehyde

B. chloropicrin

C. carbonyl chloride

D. formic acid

Answer: C

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59. Which of the following is used in fire extinguishers ?

A. CH_4

B. $CHCl_3$

C. CH_2Cl_2

D. CCl_4

Answer: D

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60. Depletion of ozone layer causes

A. freon

B. alkane

C. Grignard reagent

D. benzene

Answer: A

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

A. $\mathrm{C}Cl_2F_2$

B. $CHCl_3$

C. CH_2F_2

D. CF_4

Answer: A

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62. The molecular formula of DDT has _____.

A. 5 chlorine atoms

B. 4 chlorine atoms

C. 3 chlorine atoms

D. 2 chlorine atoms

Answer: A

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63. Use of chlorofluorocarbons is NOT encouraged because _____.

A. they are harmful to the eyes of people that use it

B. they damage the refrigerators and air conditioners

C. they deplete away the ozone in the atmosphere

D. they destroy the oxygen layer

Answer: C

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64. Which of the following is NOT a nucleophile ?

A. BF_3

B. NH_3

C. $CH_3CH_2NH_2$

D. H_2O

Answer: A

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65. During homolytic fission _____ are formed .

A. carbocations

B. ions

C. carbonions

D. free radicals

Answer: D

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66. Which of the following is not an electrophile ?

A. NH_3

B. $AlCl_3$

C. SO_3

D. BF_3

Answer: A

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67. Which of the following is an electrophile ?

A. NH_3

B. $BeCl_2$

C. OH^-

D. CN^-

Answer: B

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68. Carbanion contains _____ electrons in valence shell

A. six

B. ten

C. eight

D. five

Answer: C

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69. Identify organometallic compound(s).

A. CH_3ONa

B. C_2H_5SNa

C. CH_3MgI

D. All of these

Answer: C

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70. X' is an optically active alkane having lowest molecular mass, Predict the structure of the major product obtained on monochlorination of 'X'.

A. $CH_3 - CH_2 - CH_2 - \underset{Cl}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}} - CH_2 - CH_3$

B. $CH_3 - CH_2 - CH_2 - \overset{CH_3}{\underset{|}{C}}\ H - \underset{Cl}{\underset{|}{CH}} - CH_3$

C. $CH_3 - CH_2 - CH_2 - \overset{CH_3}{\underset{|}{C}}\ H - CH_2 - CH_2 - Cl$

D. $Cl + CH_2 - CH_2 - CH_2 - \overset{CH_2}{\underset{|}{C}}\ H - CH_2 - CH_3$

Answer: A

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71. The synthesis of alkyl fluoride is best accomplished by:

A. Free radical fluorination

B. Sandmeyer's reaction

C. Finkelstein reaction

D. Swarts reaction

Answer: D

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72. Consider the reaction :

$$CH_3CH_2CH_2Br + NaCN \rightarrow CH_3CH_2CH_2CN + NaBr$$

This reaction will be the fastest in :

A. water

B. ethanol

C. methanol

D. N,N-dimethylformamide (DMF)

Answer: D

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73. Chlorination of ethane is carried out in the presence of

A. anhydrous $AlBr_3$

B. mercuric chloride

C. ultraviolet light

D. zinc chloride

Answer: C

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74. Which of the following is allylic halide ?

A. Benzyl chloride

B. (1-Bromoethyl)benzene

C. 1-Bromobenzene

D. 3-Chlorocyclohex-1-ene

Answer: D

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75. Which of the following alkyl halides is used as a methylating agent ?

A. CH_3I

B. C_2H_5Br

C. C_2H_5Cl

D. C_6H_5Cl

Answer: A

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76. 50% of the reagent is used for dehydrohalogenation of 6.45 g CH_3CH_2Cl . What will be the weight of the main product obtained ?

[Atomic mass of H , C and Cl are 1 ,12 and 35.5 g/mol respectively]

A. 0.7 g

B. 1.4 g

C. 2.8 g

D. 5.6 g

Answer: B

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77. Assertion : Reaction of but-1-ene with HBr gives 1-bromobutane as major product.

Reason : Addition of hydrogen halides to alkenes proceeds according to Markownikoff's rule .

The CORRECT answer is _____

A. Assertion and Reason are correct. Reason is the correct explanation of Assertion.

B. Assertion and Reason are correct but Reason is not the correct explanation of Assertion.

C. Assertion is correct but Reason is not correct.

D. Assertion is not correct but Reason is correct.

Answer: D

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78. 12.3 g 1-bromopropane is treated with alcoholic KOH. What mass of propene is obtained if yield is 50% ?

A. 6.05 g

B. 12.3 g

C. 4.2 g

D. 2.1 g

Answer: D

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79. 3-menthyl-pent-2-ene on reaction with HBr in presence of peroxide forms an addition product. The number of possible stereoisomers for the product is

A. six

B. zero

C. two

D. four

Answer: D

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80. An example of a sigma bonded organometallic compound is:

A. Grignard's reagent

B. Ferrocene

C. Cobaltcene

D. Ruthenocene

Answer: A

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

(I) $CH_3CH_2OH + HCl \xrightarrow{\text{anhydrous } ZnCl_2}$

(II) $CH_3CH_2OH + HCl \rightarrow$

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

(IV) $(CH_3)_2CHOH + HCl \xrightarrow{\text{anhydrous} ZnCl_2}$

A. (IV) only

B. (III) and (IV) only

C. (I),(III) and (IV) only

D. (I) and (II) only

Answer: C

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Evaluation Test

1. In the following sequence of reactions,

$CH_3CH_2CH_2Br \xrightarrow{\text{KOH}\,(Alc)} (\text{A}) \xrightarrow{\text{HBr}} (\text{B}) \xrightarrow{\text{KOH}\,(aq)}$ (C) The product (C) is

A. propene

B. propyne

C. propan-1-ol

D. propan-2-ol

Answer: D

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2. In the following sequence of the reactions :

$$CH_3CH_2CH_2I \xrightarrow{KOH\,(Alc.)} A \xrightarrow[(ii)\,alc.KOH]{(i)\,Br_2} B \xrightarrow{Na/NH_3} C$$

The end product C is :

A. alkene

B. alkanol

C. alkyne

D. alkylamine

Answer: C

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3. In the reaction

$$CH_3C \equiv C^- - Na^+ + (CH_3)_2CH - Cl \rightarrow ?$$

the product formed is .

A. 4-methylpent-2-yne

B. propyne

C. propyne and propene

D. 3-methylpent-2-yne

Answer: A

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4. Which one of the following is most reactive towards nucleophilic substitution reaction ?

A. $H_2C = CH - Cl$

B. $C_6H_5 - Cl$

C. $CH_3 - CH = CH - Cl$

D. $Cl - CH_2 - CH = CH_2$

Answer: D

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5. Isopropyl chloride undergoes hydrolysis by :

A. S_N1 mechanism

B. S_N2 mechanism

C. S_N1 and S_N2 mechanism

D. neither S_N1 nor S_N2 mechanism

Answer: C

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6. Which compound shows S_N1 mechanism as well as optical isomerism ?

A. Benzyl chloride

B. Allyl chloride

C. 1-Bromo-1-phenylethane

D. 2-Chlorobutane

Answer: C

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

A. the formation of less stable carbonium ion

B. resonance stabilisation

C. longer carbon halogen bond

D. the inductive effect

Answer: B

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8. Which chloroderivative of benzene among the following would undergo hydrolysis most readily with aqueous sodium hydroxide to

furnish the corresponding hydroxyderivative ?

A. 

B. 

C. 

D. 

Answer: A

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9. $o-Toluic$ acid on reaction with Br_2+Fe gives

A. 

B. 

C. 

D. 

Answer: C

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

A. 4-Bromobenzyl cyanide

B. 4-Cyanobenzyl chloride

C. 4-Cyanobenzyl cyanide

D. 4-Bromo-2-cyanobenzyl chloride

Answer: A

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11. Identify 'C' in the following sequence :

$$C_6H_5NH_2 \xrightarrow[273K]{NaNO_2+HCl} A \xrightarrow{CuCN} B \xrightarrow{LiAlH_4} C$$

A. 

B. 

C. 

D. 

Answer: A

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12. The compound $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{Cl}{|}}{C}} - CH_3$ will undergo _____.

A. S_N1 mechanism

B. S_N2 mechanism

C. S_N1 and S_N2 mechanism

D. none of these

Answer: A

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13. Benzene reacts with $CHCl_3$ in the presence of arhydrous $AlCl_3$ to form

A. chlorobenzene

B. toluene

C. mixture of ortho and para chlorotoluene

D. triphenylmenthane

Answer: D

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14. The intermediate during the addition of HI to propene in presence of peroxide is _____.

A. $CH_3 - \dot{C}H - CH_2 - I$

B. $CH_3 - \dot{C}H - CH_3$

C. $CH_3 - CH_2 - \dot{C}H_2$

D. $CH_3 - CHI - \dot{C}H_2$

Answer: B

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15. The organo bromo compound which shows complete stereochemical inversion during a S_N2 reaction is _____.

A. CH_3Br

B. $(C_2H_5)_2CHBr$

C. $(CH_3)_3CBr$

D. $(CH_3)_2CHBr$

Answer: A

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16. An alkyl chloride produces a single alkene when it reacts with sodium ethoxide and ethanol . This alkene on hydrogenation produces 2-Methylbutane. What is the identity of the alkyl halide ?

A. 1-Chloro-2,2-dimethylpropane

B. 1-Chlorobutane

C. 1-Chloro-2-methylbutane

D. 2-Chloro-2-methylbutane

Answer: C

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

A. $C_6H_5CH_2OCH_2C_6H_5$

B. $C_6H_5CH_2OH$

C. $C_6H_5CH_3$

D. $C_6H_5CH_2CH_2C_6H_5$

Answer: C

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18. An alkyl iodide (X) reacts with sodium in ether to form 4,5-diethyloctane , the compound (X) is _____.

A. $CH_3(CH_2)_3I$

B. $CH_3(CH_2)_5I$

C. $CH_3(CH_2)_3CH(I)CH_3$

D. $CH_3(CH_2)_2CH(I)CH_2CH_3$

Answer: D

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19. Which of the following is NOT a haloalkane ?

A. Freon

B. Teflon

C. Iodoform

D. Vinyl chloride

Answer: D

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