CHEMISTRY

BOOKS - KUMAR PRAKASHAN KENDRA CHEMISTRY (GUJRATI ENGLISH)

HYDROCARBONS

Section A Questions

1. What do you mean by hydrocarbons ? Give the names of the hydrocarbons that play a key role in our life daily life.

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2. Write the names of hydrocarbons fuel used in daily life and write their uses ?

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3. Give the uses of hydrocarbon with examples.

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4. Importance of hydrocarbons.

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5. Given strength of pollutant agent of hydrocarbons which are use as fuel.

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6. Give the classification depending upon bonds.

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7. Give classification of hdyrcarbons.

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8. Give classification of hydrocarbons based on carbon-carbon bonds.

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9. What do you mean by Alkane ? Explain the formation of alkane from methane, substituting the hydrogens by $-CH_3$ groups ?

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10. Give the general formula of alkane series and discuss about eh structure of methane.

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11. Give the name, formula and structure of the cycloalkane which have only one structure.

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12. What is structural isomerism ? Give two isomers of chain isomerism of alkane.

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13. Explain isomerism of alkane having more than three carbon by the two examples of alkane.

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14. Give the forms of carbons with examples.

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15. Give the number of isomers of methane ethane, propane, butane, pentane, hexane, heptane and decane.

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16. Give the general formula of alkyl group with examples up to four carbon.

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17. Give the preparations of alkane ? Give the general reaction.

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18. Write the detail about hydrogenation of unsaturates hydrocarbon.

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19. Give the preparation of alkane from the unsaturated hydrocarbons.

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20. Give the example of preparation of alkane from the alkyl halide ?

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21. Write about Wurtz reaction or give the preparation of alkane from alkyl halide by Wurtz reaction with the example and its limitations ?

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22. Why is Wurtz reaction not preferred for the preparation of alkanes containing odd number of carbon atoms ? Illustrate your answer by taking one example.

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23. Explain decarboxylation with its examples.

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24. Give in the product by carboxylic acid method with examples ?

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25. Give the formation of alkane by Kolbe's electrolysis method with its examples.

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26. Give the preparation of alkane from carboxylic acid by the electrolysis.

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27. Explain as there is increase in molecular weight of alkane there is increase in boiling point and melting point.

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28. Explain why lower alkanes are gaseous in state and higher alkane are liquid in state ?

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29. Give the difference in boiling point and meting point in alkane series in short ?

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30. Give physical properties of alkane ?

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31. Explain the difference between the boiling point of branched structures of pentane (C_5H_{12}).

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32. Explain the boiling point of isomeric branched structure of alkane.

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33. Give the chlorination of methane in presence of hv ?

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34. What is alkane substitution reactions ? Give different types of substitution reactoins name and possibilities.

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35. How do you account for the formation of ethane during chlorination of methane ?

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36. Give mechanism of chhlorination of methane.

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37. Give the different types of reaction of alkane compound.

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38. Give the combustion reaction of alkane.

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39. Give the complete and incomplete combustion of heptane and nonane.

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40. Explain the isomerization reaction of alkane.

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41. Write a note on aromatization of alkane ?

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42. Controlled oxidation of alkanes.

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43. What is the pyrolysis of alkane ? Give reaction.

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44. Give the reaction of methane by steam

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45. Liberation of dihydrogen from methane by steam reaction ?

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46. Complete the reaction as follows.

$CH_4 +$ Required Cl_2

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47. Complete the reaction as follows.

$CH_4 +$ More Cl_2

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48. Complete the reaction as follows.

$CH_4 + HIO_3$

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49. Complete the reaction as follows.

Controlled chlorination of ethane :

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50. Complete the reaction as follows.

Complete oxidation of methane :

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51. Complete the reaction as follows.

Complete oxidation of butane :

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52. Complete the reaction as follows.

Complete oxidation of alkane :

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53. Complete the reaction as follows.

Incomplete combustion of methane :

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54. Complete the reaction as follows.

$$CH_3(CH_2)_4CH_3 \xrightarrow[AlCl_3HCl_{(g)}]{\text{Anhy.}}$$

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55. Complete the reaction as follows.

n-Hexane $\xrightarrow{\text{Aromatization}}$

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56. Complete the reaction as follows.

n-Heptane $\xrightarrow{\text{Aromatization}}$

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57. Complete the reaction as follows.

$$CH_4 + O_2 \xrightarrow[100\ \text{atm}]{\text{Cu, 523 K}}$$

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58. Complete the reaction as follows.

$$CH_4 + O_2 \xrightarrow{Mn_2O_3,\ \Delta}$$

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59. Complete the reaction as follows.

$$CH_3CH_3 + O_2 \xrightarrow[\Delta]{(CH_3COO)_2Mn}$$

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60. Complete the reaction as follows.

Pyrolysis of hexane :

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61. Complete the reaction as follows.

Pyrolysis of kerosene :

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62. Complete the reaction as follows.

Liberation of dihydrogen gas reaction :

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63. Complete the reaction as follows.

Oxidation 2-methylpropane reaction :

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64. Hexane from different type of product in different types of situation.

Give three reaction.

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65. Give the chemical reaction of methane.

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66. Prepare the following product from methane (i) Methyl chloride (ii) Carbon black (iii) Carbon monoxide (iv) Methanol (v) Methanal (vi) carbonmonoxide (vii) dihydrogen (viii) Methyl iodide (ix) Methyl bromide

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67. Write the preparation of methane from methyl chloride and acetic acid.

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68. Write the preparation of ethane.

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69. Write the reaction of preparation of ethane from following reaction. (i) Ethane (ii) Ethyl chloride (iii) Bromo-methane (iv) Propanoic acid (v) Acetic acid (vi) Methane (vii) from acetate ion.

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70. What do you mean by conformation and conformer (Rotamers)

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71. How many conformations of alkane are present ? Why ?

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72. What do you mean by torsional strain ?

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73. Give the difference between eclipsed ethane and staggered ethane ?

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74. Explain saw horse projection with examples.

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75. Explain conformers of newman projection with example.

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76. How many eclipsed and staggered ethanes is obtained if rotation of ethane of C-C of 0 to 360° ?

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77. Explain change of energy with graph when internal ethane of C-C rotation after 120°.

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78. Complete the below reaction :

(i) $CH \equiv CH + 2H_2 \xrightarrow[523-573K]{Ni,}$

(ii) $CH_3C \equiv CH + 2H_2 \xrightarrow[\text{or Raney nickel, } \Delta]{\text{Pd or Pt}}$

(iii) 1-chlorobutane $+ H_2 \xrightarrow{Zn, H^+}$

(vi) $CH_3CH_2CH_2CH_3 \xrightarrow[HCl, \Delta]{\text{Anhy, } AlCl_3}$

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79. From the followig whichtypes of ethere's angle will be constant which angle will be changed ?

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80. What do you mean by alkene ? Give its general formula and two examples.

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81. What do you mean by olefin ? Give example ?

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82. Give the structure of alkene having double bond.

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83. Reactivity of alkene

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84. Explain reactivity of alkene towards electrophilic.

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85. Give the structure of orbit picture of ethene show (i) σ-bond (ii) π-bond (iii) Give the number of σ and π-bond. (iv) Write the dihybridisation.

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86. Who is the first member of alkene series ? Give information about its bond and structure.

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87. For the nomenclature of alkene, give the ruler of giving the names of structure ?

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88. Give the formula, structure, IUPAC names and common name of alkene having carbon = 1, 2, 3, 4 ?

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89. Give classification of nomenclature with example.

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90. Give the information about structure of alkene.

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91. Explain optical isomerism or Geometrical isomerism with example.

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92. Whose boiling point is less in cis and trans geometer ? Explain with example.

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93. In cis and trans, whose dipole moment is more, explain with example ?

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94. Cis-but-2-ene is polar and trans-but-2-ene is non-polar explain.

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95. Preparation of alkene by hydrogenation explain with example.

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96. Prepare alkene from alkylhalide (dehydrohalogenation). Explain its detail.

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97. Write in brief for the preparation of alkene from vicinal dihalide.

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98. Explain with example dehalogenation of vicinal dihalide.

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99. Write the preparation of alkene from alcoholes by acidic dehydration.

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100. Explain with example acidic dehydration of alcohole.

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101. Give β-elimination of given alcohol reaction. (i) Propyl alcohol (ii) Isopropyl alcohol (iii) Cyclo hexanol (iv) tertiary-butyl alcohol.

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102. Given reaction are of which type ?

(a) $CH_3CH_2OH \xrightarrow{\text{Conc.}H_2SO_4} CH_2 = CH_2 + H_2O$

(b) $CH_2BrCH_2Br + Zn \xrightarrow{\Delta} CH_2 = CH_2 + ZnBr_2$

(c) $CH_3CHBr - CH_2Br + Zn \xrightarrow{\Delta} CH_3CH = CH_2 + ZnBr_2$

(d) $RC \equiv CR' + H_2 \xrightarrow{\text{Na, liquid } NH_3} RCH = CHR'$

(e) $CH_3CH_2Cl + KOH \xrightarrow[KOH]{\text{Ethanol}} CH_2 = CH_2 + KCl + H_2O$

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103. Give the physical properties of alkene ?

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104. Give the types of reactions that alkene gives. Write the name of reaction.

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105. Write the halogenation of alkene.

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106. Explain Markanikov hydrohalogenation of alkene.

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107. Explain the propene reacts with HBr.

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108. Rules for Markonikov's and explain with example.

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109. Anti Markovnikov's rule or peroxide effect (Kharas effect) or free radical addition reaction with example ?

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110. Addition of sulphuric acid in alkene and addition of sulphuric acid in alkene with addition reaction.

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111. Addition of H_2O into alkene.

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112. Hydrolysis of alkene.

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113. Formation of alcohol from alkene.

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114. Write about ozonolysis of alkene.

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115. Explain with example oxidation of alkene in different situations ?

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116. What is polymerisation ? Write the example and uses of the reaction.

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117. Write the polymerication of alkene ?

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118. Addition of HBr to propene yields 2-bromo-propene, while in the presence of benzoyl peroxide, the same reaction yields 1-bromo-propane. Explain and give mechanism.

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119. Complete the following reaction :

(i) Isopropyl bromide $\xrightarrow[KOH\ ,\ \Delta]{\text{Alcohol}} X \xrightarrow[\text{Peroxide}]{\text{HBr}} Y$

(ii) n-propyl Alcohol $\xrightarrow[443K]{\text{Conc.}H_2SO_4} X \xrightarrow[C]{HBr} Y$

(iii) 1-Chloropopane $\xrightarrow[KOH]{\text{Ethanol}} (B) \xrightarrow[CCl_4]{HBr} Y$

(iv) Ethane $\xrightarrow[h\nu]{Cl_2} (B) \xrightarrow{\text{Na, Ether}} (C)$

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120. Write the main product of given reaction :

(i) $C_6H_5CH = CH_2 \xrightarrow{HBr}$

(ii) $C_4H_{10} \xrightarrow{\text{Air } \Delta}$

(iii) $CH_3 - \underset{\underset{CH_3}{|}}{C} = CH_2 \xrightarrow{Br_2}$

(v) $(CH_3)_2CHCHBrCH_3 \xrightarrow[KOH\,,\,\Delta]{\text{Ethanol}}$

(vi) $CH_3CH = CHCH_3 + HBr \rightarrow$

(vii) $CH_3 - \overset{CH_3}{\underset{|}{C}} = CH_2 + HBr \rightarrow$

(viii) $CH_3 - CH = \overset{CH_3}{\underset{|}{C}} - CH_3 - HCl \rightarrow$

(ix) 3-Methyl but-1-ene+HBr

(x) $CH_3CH = CHCH_3 \xrightarrow[KMnO_4]{\text{Cold}\quad,Na_2CO_3}$

(xi) 2, 3-Dimethyl but-2-ene $\xrightarrow{\text{Bayer test}}$

(xii) Cyclonexanol + alcoholic $KOH + \Delta$

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121. Give the primary information about alkyne.

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122. Give the structure, formula and names of 1 to 4 carbon alkynes.

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123. Give brief about structure of ethye (Acetylene).

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124. Give industrial preparation method of ethyne.

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125. Give mehod of preparation of ethyne from calcium carbonate or calcium carbide.

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126. Give method of preparation of ethyne (Acetelene) from vicinal dihalides.

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127. Give main product of the following reaction. (in one step)

(i) 1, 2-dibromo propane + alcoholic KOH

(ii) 1, 1, 2,2-tetrabromo ethane + zinc powder in methanol

(iii) 1,1,2,2-tetrabromo propane + zinc powder in methanol.

(iv) Reaction occur on passing of hydrogen gas through carbon electrode at high temperature in electric arc.

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128. Write about physical properties of alkyne.

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129. Give brief note on acidic nature of alkyne.

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130. Explain acidic nature of ethyne.

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131. Explain : 'Hydrogen attached with carbon having triple bond is acidic in nature'. And write appropriate reaction for it.

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132. Give distinguishing test for the following :

(a) ethane and ethyne (Alkane and alkyne $RC \equiv CH$)

(b) Ethene and Ethyne (Alkene and Alkyne $RC \equiv CH$)

(c) Dimethyl ethyne and ethyne

(d) Ethane and Ethene (Alkane and alkene)

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133. Explain : "Why alkyne compound gives electrophilic addition reaction ?"

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134. Give hydrogenation and halogenation reaction of alkyne.

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135. Give rection which shows hydro-halogenation and hydration of alkyne.

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136. Write a note on addition of hydrogen halide and water into alkyne.

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137. Explain polymerization of alkyne.

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138. Give type of polymerization of alkyne and give note on each.

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139. Wrute following reaction :

(i) Ethyne + $(Cl_2 \quad \text{or} \quad Br_2 + H_2O) \rightarrow$

(ii) Hydration reaction of 1-butyne.

(iii) Reaction of acetenelene with HCN.

(iv) Hydrogenation of ethyne in presence of Lyndlar catalyst $(Pd, BaSO_4)$.

(v) Complete combustion of ethyne in presence of air.

(vi) Reaction of propyne with alkaline $KMnO_4$.

(vii) Ozononolysis of ethyne.

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140. Discuss how many types and which reaction are given by alkyne ?

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141. Give reaction for following reaction.

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142. Give basic information about aromatic hydrocarbon.

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143. Explain and give examples of following :

(i) Aromatic (ii) Arene (iii) Benzenoid (iv) non-benzenoid

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144. Only mono-substitution is possible in benzene, give its structure and name.

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145. Give the numbers of product obtained by substitution of two hydrogen atoms from the benzene ring and also give its examples.

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146. Write a detail note on structure of benzene.

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147. Write the conditions which proves exceptional stability of bezene.

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148. What is Aromatic ? Explain with suitable examples.

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149. Write Huckel rule and explain with suitable example.

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150. Write the requirements for aromatic character in compound.

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151. Show aromatic structure having 1, 2 and 3 rings with suitable example.

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152. Give methods of preparation for benzene.

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153. Draw the structure of compound having C_7H_8 and give number of σ and π bonds.

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154. Write about physical properties of benzene.

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155. Which type of chemical reaction does given by arene compounds ? Give there suitable examples and reactions.

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156. Give addition reactions of benzene with chemical reactions.

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157. Give various oxidation reactions of benzene.

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158. Write about nitration reaction of benzene.

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159. Explain halogenation of benzene with example of chlorination.

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160. Explain the bromination of benzene with its mechanism.

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161. Give examples of Friedel-Craft's alkylation.

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162. Which catalyst is used in Friedel-craft alkylation reaction ? And what is its function ?

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163. Explain which type of mechanism is involved in alkylation of benzene ?

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164. Which product is obtained when benzene is heated with CH_3Cl in presence of $AlCl_3$? Why ?

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165. Explain the reaction of benzene with n-propyl chloride.

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166. Mention main product of reaction of benzene with 1-chloropropane.

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167. Give reaction of acylation of benzene and its mechanism.

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168. Write the sulphonation reactions of benzene.

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169. What is the electrophile in sulphonation reaction of benzene ? And how it is obtained ?

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170. Write in brief about reaction steps of sulphonation reaction of benzene OR sulphonation mechanism.

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171. Enumerate different aromatic electrophilic substitution reactions and give the reactions which shows how the electrophiles $\left(E^{+}\right)$ are formed.

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172. Explain mechanism of first step of general electrophilic substitution reaction for benzene.

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173. Explain seconds steps of general electrophilic substitution reaction of benzene.

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174. Discuss step which involve liberation of proton from σ-complex.

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175. Which are the various steps of electrophilic substitution of benzene ?

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176. Explain position direciton properties of groups in mono substituted benzene. With suitable examples.

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177. What do you mean by ortho and para position directional groups ? Explain ortho and para position directional effect by taking examples of any group.

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178. Explain why reactivity of benzene ring is increases due to presence of -OH group in phenol.

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179. What is mean by meta directing group ? Give examples of it and explain meta directing effect of $-NO_2$.

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180. What is mean by activator groups ? Explain with suitable examples.

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181. What is mean by inactivators of groups ? Explain with suitable examples.

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182. Why does benzene undergo electrophilic substitution reactions easily and nucleophilic substitution with difficulty ?

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183. Write chemical equations for combustion reaction of the following hydrocarbons : (i) Butane (ii) Pentene (iii) Hexyne (iv) Toluene

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184. Write IUPAC names of the following compounds :

(a) $CH_3CH = C(CH_3)_2$

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

(c) 

(f)
$$\begin{array}{l} CH_3(CH_2)_4CH(CH_2)_3CH_3 \\ \qquad\qquad\quad | \\ \qquad\qquad\quad CH_2 - CH(CH_3)_2 \end{array}$$

(g)

$$CH_3 - CH = CH - CH_2 - CH = CH - \underset{\underset{C_2H_5}{|}}{CH} - CH_2 - CH = CH_2$$

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185. How would you convert the following compounds into benzene ?

(i) Ethyne (ii) Ethene (iii) Hexane

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186. Write down the products of ozonolysis of 1, 2-dimethylbenzene (o-xylene). How does the result support Kekule structure for benzene ?

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187. Arrange benzene, n-hexane and ethyne in decreasing order of acidic behaviour. Also give reason for this behaviour.

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188. Suggest the name of a Lewis acid other than anhydrous aluminium chloride which can be used during ethylation of benzene.

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189. Explain why the following system are not aromatic ?

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190. Out of benzene, m-dinitrobenzene and toluene which will undergo nitration most easily and why ?

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191. Arrange the following set of compounds in order of their decreasing relative reactivity with an electrophile, E^+

(a) Chlorobenzene, 2, 4-dinitrochlorobenzene, p-nitrochlorobenzene

(b) Toluene, $p-H_3C-C_6H_4-NO_2p-O_2N-C_6H_4-NO_2$

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192. How will you convert benzene into

(i) p-nitrobromobenzene (iii) p-nitrotoluene

(ii) m-nitrochlorobenzene (iv) acetophenone ?

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193. Give chemical reaction fo the following conversion :

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194. Unknown organic metal oxide (A) heated with carbon will gives compound (B), which on reaction with water gives ethyne. So what are the compound A and B ?

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195. Two compounds with molecular formula C_4H_6 is available , if one of the compound can react with soda amide while second can't react with ti, then find out that organic compound ?

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196. Give name and structure of aromatic compound with $C_{10}H_8$ molecular formula. And give the number of σ and π bonds present in the structure.

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197. Give name and structure of aromatic hydrocarbon with molecular formula $C_{12}H_{10}$ which contain two benzene ring.

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198. One of the aromatic compound X when heated with powder of Zn gives benzoic acid but on heated with sodalime gives phenol. So give the name of X compound.

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199. One unknown compound X on hydrocarbon. Which on reaction with $HgSO_4\left(H^+\right)$ gives compound (B). (B) on oxidation gives compound (C). (C) on reaction with NaOH and soda lime gives methane. So identify A, B and C by giving chemical reaction.

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200. One unknown compound X on chlorination followed by wurtz reaction and dehydro halogenation gives ethene. So give whole reaction with stepwise manner.

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201. Why is benzene extra ordinarily stable though it contains three double bonds ?

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202. What are the necessary conditions for any system to be aromatic ?

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203. What effect does branching of an alkane chain has on its boiling point ?

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204. Discuss the formation of cancer causing poly nuclear hydrocarbon and also explain how they cause cancer ?

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205. Give name and structure of cancer causing hydrocarbon.

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206. Give difference.

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207. Give the examples and name.

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208. Write down effect of incomplete combustion of petrol in vehicles.

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Section A

1. Write structures of different chain isomers of alkanes corresponding to the molecular formula C_6H_{14}. Also write their IUPAC names.

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2. Give the IUPAC name and structure and the states of carbon in it ?

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3. Write structures of different isomeric alkyl groups corresponding to the molecular formula C_5H_{11}. Write IUPAC names of alcohols obtained by attachment of -OH groups at different carbons of the chain.

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4. Give the IUPAC nomenclature of following structures with its proper rule of IUPAC.

(a) $(CH_3)_2CH - CH_2 - CH(CH_2CH_3)_2$

(b)

$CH_3 - CH_2 - CH_2CH\left[CH(CH_3)_2\right] - CH(CH_3) - C(CH_2 - CH_3)_3$

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5. Sodium salt of which acid will be needed for the preparation of propane ? Write chemical equation for the reaction ?

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6. Write the IUPAC nomenclature of the following.

(d) $(CH_3CH_2CH_2CH_2)_2CHCH_2C(CH_3)_3$

(e) $(CH_3CH_2)_2CHCH_2CH(CH_3)CH_2CH_3$

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7. Give the nomenclature IUPAC of following :

(i) $(CH_3)_3CCH_2C(CH_3)_3$

(ii) $(CH_3)_2C(C_2H_5)_2$

(iii) Tetra-tert-butylmethane

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8. Write strcutural formulas of the following compounds :

(i) 3,4,4,5-Tetramethylheptane

(ii) 2,5-Dimethylhexane

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9. Write structure for each of the following compounds. Why are the given names incorrect ? Write correct IUPAC names.

(i) 2-Ethylpentane

(ii) 5-Ethyl-3-methylheptane

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10. Hydrocarbons (a) C_3H_6 (b) C_4H_8 (c) C_5H_{10} (d) C_6H_{12} formula write the unsaturated hydrocarbons formula and structures and forms ?

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11. In the alkane $H_3C - CH_2 - C(CH_3)_2 - CH_2 - CH(CH_3)_2$, identify $1^\circ, 2^\circ, 3^\circ$ carbon atoms and give the number of H atoms bonded to each one of these.

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12. Sodium salt of which acid will be needed for the preparation of propane ? Write chemical equation for the reaction ?

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13. Can methane be obtained by the kolbe's electrolysis ? Why ?

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14. Give the difference between decarboxylation and electrolysis of sodium propanoate (or propanoic acid) ?

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15. Write the reduction reaction and Wurtz reaction of 1-chloropropane ?

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16. (i) CH_3COOH (ii) C_2H_5COOH (iii) C_3H_7COOH (iv) C_6H_5COOH are heated with sodalime, there is decarboxylation. The are heated in different test-tube with sodalime, write the reactions occurred in different test-tube.

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17. Complete combustion of C_4H_{10}, CO_2 is a by product. Where C_4H_{10} has its isomers on oxidation it gives alcohol as by product. Give reaction and explain them ?

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18. In below reaction give the names and structures of A and B.

$$(A) \xrightarrow{NaOH\,,\,-H_2O} (B) \xrightarrow{NaOH\,,CaO\,,\,\Delta} CH_3CH_3$$

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19. One compound reaction with Cl_2, gives product B and product B on (Zn + dil. HCl) treated then we get our compound back A. Give the structure of A and B.

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20. Give the names structure and preparation of 6 membered cyclic ring structure C_6H_{12}, C_6H_6 and C_7H_8.

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21. Give the molecular formula, strucutral formula full structure and line structure of (i) 2-Methyl-pentane (ii) 3-Ethylpentane and (iii) 2,3-dimethyl butane.

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22. There are isomers. Identify them and give the forms of isomerization.

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23. Give the IUPAC nomenclature.

(i) $CH_3CH_2C(CH_3)(CH_2CH_3)CH_2CH(CH_3)_2$

(ii) $(CH_3)_2CHCH_2CH(C_2H_5)CH_2CH_2CH(CH_3)_2$

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24. Give the structure IUPAC name.

(i) $(C_2H_5)_4C$ (ii) $(CH_3)_4C$

(iii) 

(iv) $(CH_3CH_2)_3CCH(CH_3)_2$

(v) 

$$(CH_3)_2CH-\underset{\underset{CH_3}{|}}{CH_2CH}-CH(C_2H_5)_2$$

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25. Write IUPAC names of the following compounds :

(i) 

(iii) $CH_2 = C(CH_2CH_2CH_3)_2$

(iv)
$$\begin{array}{l} CH_3CH_2CH_2CH_2 \qquad\quad CH_2CH_3 \\ \qquad\qquad\quad | \qquad\qquad\quad | \\ CH_3 - CHCH = C - CH_2 - CHCH_3 \\ \qquad\qquad\qquad\qquad\qquad\qquad\quad | \\ \qquad\qquad\qquad\qquad\qquad\qquad CH_3 \end{array}$$

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26. In given structure, give the no of σ and π bond ?

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27. Give the IUPAC names :

(i) $(CH_3)_2CH - CH_2 - CH = CH - CH = CH - CH(CH_3)_2$

(ii) 

(iii)
$$\begin{array}{l} H_3C - CH - CH = C - CH_2 - CH - CH_3 \\ \qquad\quad | \qquad\qquad\quad | \qquad\qquad | \\ \qquad CH_3CH_2 \qquad C_2H_5 \qquad\quad CH_3 \end{array}$$

(iv) $CH_3 - CH = C(CH_2CH_2CH_3)_2$

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28. Write structures and IUPAC names of different structural isomers of alkenes corresponding to C_5H_{10}

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29. Draw cis and trans isomers of the following compounds. Also write their IUPAC names :

(i) $CHCl = CHCl$ (ii) $C_2H_5CCH_3 = CCH_3C_2H_5$

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30. Which of the following compounds will show cis-trans isomerism ?

(i) $(CH_3)_2C = CH - C_2H_5$

(ii) $CH_2 = CBr_2$

(iii) $C_6H_5CH = CHC_6H_5$

(iv) $CH_3CH = CClCH_3$

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31. Draw the cis and trans structures of hex-2-ene. Which isomer will have higher b.p. and why ?

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32. From the given structure whose cis and trans isomers are there ?

(i) $CH_3CH = CH_2$ (ii) $(CH_3)CH = CH_2$

(v) 3-Methyl-but-2-ene-1-ol

(vi) 2, 3-Dimethyl-but-2-ene

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33. Explain : 2-butene has 2-isomers ?

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34. From cis and Trans-2-butene, which one is stable? Explain ?

View Text Solution

35. Write IUPAC names of the products obtained by addition reaction of HBr to hex-1-ene

(i) in the absence of peroxide and

(ii) in the presence of peroxide.

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36. Write IUPAC names of the products by the ozonolysis of the following compounds :

(i) Pent-2-ene

(ii) 3,4-Dimethylhept-3-ene

(iii) 2-Ethylbut-1-ene

(iv) 1-Phenylbut-1-ene

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37. An alkene 'A' on ozonolysis gives a mixture of ethanal and pentan-3-one. Write structure and IUPAC name of 'A'.

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38. An alkene 'A' contains three C-C, eight C-H σ bonds and one C-C π-bond. 'A' on ozonolysis gives two moles of an aldehyde of molar mass 44u. Write IUPAC name of 'A'.

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39. Propanal and pentane-3-one are the ozonolysis products of an alkene ? What is the structural formula of the alkene ?

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40. Write structures of all the alkenes which on hydrogenation give 2-methylbutane.

View Text Solution

41. Give the IUPAC name on ozonolysis of following :

(i) 3,4-Dimethyl hept-3-ene

(ii) 2-Methyl-but-2-ene

(iii) 2-Ethyl-2-methyl-pent-2-ene

(iv) Hex-1-ene

(v) Hex-3-ene

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42. Give the IUPAC name of alkene, product obtained on ozonolysis.

(i) 2 moler propanone (Acetone)

(ii) Ethanal and propanal

(iii) Ethanal and pentane-3-one

(iv) Ethanal and butanal

(v) Propanone and butane-2-one

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43. One carbonyl hydrocarbon (X) on addition of H_2 gas addition product on ozonolysis of 'X' gives (i) Ethanal (ii) Propanone and (iii) Butane-1, 4-diol. Give the structure of 'X' and IUPAC name.

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44. Ozonolysis of hydrocarbon containing two double bond, ethanal, propanone and glyocal is formed. Give the structure of hdyroacarbon ?

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45. Give the name of unsaturated hydrocarbon gives the product 2 moles methanal and 1 mole glyoxal, Give the structure and IUPAC name.

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46. One reactant X on ozonolysis gives 2-product. In which molecular weight $= 72\mu$, in structure 16 C-H σ bond, $7C - C\sigma$ bond and 1π bond is there.

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47. One hydrocarbon X in presence of Pd, n-butane is formed on hydrogenation. X treated with acidic $KMnO_4$, on oxidation carboxylic acid is formed of 2 carbon product. Give the structure of X and IUPAC name ?

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48. Hydrogenation is done of hydrogen A of unsaturated hydrocarbon on addition of H_2. Ozonolysis of A gives acetone, acetaldehyde and propane-1, 3-diol. Give the structure and name of X ?

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49. Give the names, structure of the isomers of 4^{th} member of alkene.

View Text Solution

50. Give the name and structure of functional isomers of C_4H_8.

View Text Solution

51. Write structure of different isomers corresponding to the 5^{th} member of alkyne serie. Also awrite IUPAC names of all the isomers. What type of isomerism is exhibited by different pairs of isomers ?

View Text Solution

52. Alkyne C_3H_4 and C_4H_6 forms which type of alkene isomers ? Give their structure.

View Text Solution

53. Write isotopes of alkaline C_4H_8 and give one examples of it.

View Text Solution

54. Give the IUPAC name for the following structures.

(a) 

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

(c) $HC \equiv C - \underset{\underset{CH_3}{|}}{C} - CH = CH_2$

(d) $CH_2 = CH - CH_2 - C \equiv CH$

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55. How will you convert ethanoic acid into benzene ?

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Section B Objective Questions Short Questions

1. Give reaction for the formation of butane from ethane.

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2. Give conversion reaction for methane $\rightarrow$ ethane.

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3. Arrange the following in increasing order of boiling point.

(i) methane, butane, propane, pentane, ethane.

(ii) n-pentane, neo-pentane, iso-pentane.

(iii) ethane, 2-methyl propane, propane, n-butane.

(iv) 2methyl pentane,2,2-dimethyl butane, 2,2-dimethyl propane.

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4. What do you mean by dihedral angle or torsional angel ?

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5. Define torsional strain.

View Text Solution

6. How can you define skew confirmation ?

View Text Solution

7. State the formaton of difference angles observed in H-C-H of ethane ?

View Text Solution

8. Classify the following compounds in saturated, unsaturated and aromatic hydrocarbon. Ethane, Ethene, Ethyne, Propene, Propane, Benzene, Toluene, Anthracene, Cyclopropane.

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9. Give isotopes and their names of C_3H_6.

View Text Solution

10. Which type of isotops of C_4H_8 are possible ? Give their names and structure.

View Text Solution

11. Give bond angle and bond length of methane ?

View Text Solution

12. Methane is tetrahedral but not square planner in nature, prove it.

View Text Solution

13. Which type of hydrogen is possessed by $(CH_3)_3C$?

View Text Solution

14. One saturated hydrocarbon possess two carbon and it has same type of Hydrogen atoms, so give the structure and type of hydrogen.

View Text Solution

15. Explain why quaternary carbon is possible but quaternary hydrogen is not possible ?

View Text Solution

16. Give structure is neo-pentile group.

View Text Solution

17. Give structure of secondary and tertiary butyl.

View Text Solution

18. Give the structure of isobutyl, isopropyl and isopentyl.

View Text Solution

19. Give the structure of chain isomers and their names of C_6H_{14} molecular formula and has only methyl group.

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20. Give the structure of chain isomers and their IUPAC names of C_6H_{14} molecular formula and has two methyl group.

View Text Solution

21. Give IUPAC names of $(CH_3)_3CH(C_2H_5)_2$.

View Text Solution

22. Give IUPAC names of $(CH_3)_3CCH(C_2H_5)_2$. Why 3-methyl-4,4 dimethyl pentane is not true ?

View Text Solution

23. Explain - Why 2,2-dimethyl-3-ethyl pentane is not true name of $(CH_3)_3CCH(C_2H_5)$.

View Text Solution

24. What is hydration reaction ?

View Text Solution

25. Among CH_3F, CH_3Cl, CH_3Br and CH_3I which does not give methane on reduction ?

View Text Solution

26. Which of the following is not true for (i) $Zn +$ dilute HCl and (ii) Zn + concentrated HCl ?

View Text Solution

27. In which of the following reaction carbon number does not change on product formation ?

(i) Hydrogenation (ii) Alkyl halide reduction

(iii) Wurtz reaction (iv) Decarboxylation

(v) Kolbe reaction

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28. Which of the following reaction is used to prepare hydrocarbon with even number of carbon ?

(i) Wurtz reaction

(ii) Decarboxylation reaction

(iii) Kolbe's electrolysis

(iv) Reduction (v) Hydrogenation

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29. Give hydrolysis reaction of $C_2H_5COO^-Na^+$ occur on the anode.

View Text Solution

30. Give reaction occur of cathode during electrolysis of $C_2H_5COO^-Na^+$.

View Text Solution

31. Which type of reaction is occur in Kolbe's electrolysis ? Why ?

View Text Solution

32. Which free radicals are obtained on anode and cathode during electrolysis of $RCOO^-Na^+$ in Kolbe's electrolysis ?

View Text Solution

33. What effect does branching of an alkane chain has on its boiling point ?

View Text Solution

34. Give uses of alkane.

View Text Solution

35. Explain dry-cleaning of clothes or explain grease stains can be removed by petrol.

View Text Solution

36. Why alkane is known as "Paraffin" ?

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37. Which reactions are difficult for alkane ?

View Text Solution

38. How do you account for the formaiton of ethane during chlorination of methane ?

View Text Solution

39. Why alkane is used as fuel ?

View Text Solution

40. Give the name and use of compound produce during incomplete combustion of alkane.

View Text Solution

41. Give the different stages name of chlorination of methane.

View Text Solution

42. Give decreasing rate order for the halogenation reaction of alkyl compounds.

View Text Solution

43. Give the order for the substitution of hydrogen atoms in alkane compounds.

View Text Solution

44. Which product is formed on chlorination of $(CH_3)_3CH$? Also give comparison of their composition.

View Text Solution

45. Give reason : Why fluorination of alkane is not easier ?

View Text Solution

46. Why direct iodination is not possible ?

View Text Solution

47. How to perform iodination of alkane ? Explain with suitable example.

View Text Solution

48. What is isomerism? Why ?

View Text Solution

49. What is the difference among complete combustion, incomplete combustion and combustion of alkane ?

View Text Solution

50. "Alkane compound resist the oxidation", so what is your opinion for the following reaction ?

$$C_4H_{10(g)} + \frac{13}{2}O_{2(g)} \rightarrow 4CO_{2(g)} + 5H_2O_{(l)}$$

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51. "Alkane compounds normally resist the oxidation", what it mean ?

View Text Solution

52. Which type of reaction can be performed on reaction of $(CH_3)_3CH$ with $KMnO_4$? Why ?

View Text Solution

53. The product of one reaction at 773 K temperature is $(C_7H_{16} + C_5H_{10})$. So give the molecular formula and type of reaction.

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54. Combustion of alkane (Petrol) causes pollution how ?

View Text Solution

55. Give incomplete combustion reaction of methane, hepetane and nonane.

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56. (i) Give reaction for bromination of ethane.

(ii) Is this reaction suitable for pure bromoethane ? Why ?

(iii) Give tha name of mechanism of reaction and name of stages occurred in reaction.

(iv) Give reaction for first stage.

(v) Which type of bond cleavage occurred in first stage ?

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57. Which types of bond exist between two carbon of alkene ?

View Text Solution

58. What are the enthalpies of σ-bond and π-bonds in alkene?

View Text Solution

59. Give bond enthalpies and bond length between carbon and carbon of alkane ?

View Text Solution

60. Which one is more reactive between alkane and alkene ? Why?

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61. Which bond is stronger between single bond of C-C of alkane and double bond C=C of alkene ?

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62. Which type of reactions are easily performed by alkane and alkene ?

View Text Solution

63. Which orbitals on overlapping will form σ and π-bond in C=C of alkene ? Explain.

View Text Solution

64. Which type of hybridization found in C-C single bond of alkane and C=C bond of alkene ?

View Text Solution

65. What do you mean by strength and reactivity of bond ?

View Text Solution

66. How to decide the chemical reactivity of compound ? Give example.

View Text Solution

67. What is Lindlar's catalyst ? Write its uses.

View Text Solution

68. Which reactant is used to prepare trans alkene from alkyne ?

View Text Solution

69. What do you mean by dehydrohalogenation ?

View Text Solution

70. What is vicinal dihalides ? Give examples.

View Text Solution

71. Which compound gives β-elimination reactions ? What are their main product ?

View Text Solution

72. Give the differential reaction for butane and butane and give the reaction.

View Text Solution

73. Name the distinguishing reaction of alkane from alkene.

View Text Solution

74. What is the difference in reaction of alkene with HBr in presence of peroxide and in absence of peroxide ?

View Text Solution

75. Arrange HI, HCl, HBr and HF in increasing order of rate of reaction with alkene.

View Text Solution

76. Which reactants are used to prepared cis and trans alkenes from alkynes ?

View Text Solution

77. What is dehydrohalogenation ?

View Text Solution

78. Name the reaction, heating of 1,2-dibromoethane with zinc powder ?

View Text Solution

79. Give common formula of alkyl group.

View Text Solution

80. Give the name of dehydrohalogenation and dehydration of alcohol compound in presence of acid.

View Text Solution

81. Which different type of reaction mechanism is observed in addition reaction ?

View Text Solution

82. Why CCl_4 is added in bromination of alkene ?

View Text Solution

83. What is known as asymmetrical alkene ? Give examples.

View Text Solution

84. Which reaction is known as Kharash reaction ?

View Text Solution

85. Among HCl, HBr and HI which reactant gives Kharash reaction with alkene ?

View Text Solution

86. Explain product of reaction

$CH_3CH = CH_2 + HCl \xrightarrow{\text{Peroxide}}$

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87. Give the order of bond strength of H-Cl-H-Br, H-I.

View Text Solution

88. What is the product obtained from the HCl, HBr and Hi in presence of peroxide ?

View Text Solution

89. Which of the following carbocation is most stable ?

$(CH_3)_2CH-\overset{+}{C}HCH_3$ and $(CH_3)_2\overset{+}{C}-CH_2CH_3$

View Text Solution

90. Give homolysis reaction of $(C_6H_5CO)_2O-O$.

View Text Solution

91. On attachment of H and Br from the HBr to C_6H_5 free radical what can be formed ?

View Text Solution

92. What will be the change in boiling point of alkene compound on addition of each $-CH_2$ group ?

View Text Solution

93. Which type of rate is observed in dehydrohalgenation (β-elimination) reaction of alkyl halide ?

View Text Solution

94. Give order of stability for different alkenes.

View Text Solution

95. Give increasing order for stability of alkene (ΔH°).

$(CH_3)_2C = C(CH_3)_2, CH_3CH_2CH_2CH = CH_2,$

$(CH_3)_2C = CHCH_3, CH_3CH_2C(CH_3) = CH_2$

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96. Give hybridization of carbon from the following :

$CH_3 - CH = CH - CH_2 - C \equiv C - H$

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97. Give number of σ and π bonds in above compounds of questions (i).

View Text Solution

98. Give IUPAC name of above compound.

View Text Solution

99. Draw the geometrical isomers of above compound.

View Text Solution

100. Why cis and trans isomers are not possible in alkyne ?

View Text Solution

101. Which bond possess more bond length between C=C and $C \equiv C$?

View Text Solution

102. What is bond length of $-\overset{|}{\underset{|}{C}}-\overset{|}{\underset{|}{C}}-$  and $-C \equiv C-$?

View Text Solution

103. What will be effect on bond length as bond multiplicity increases ?

View Text Solution

104. What is the relation between reactivity of compound, bond strength and bond order between two carbon atoms ?

View Text Solution

105. What is the rate of reaction with Cl_2, Br_2 and I_2 with $CH_2 \equiv CH_2$.

View Text Solution

106. What is the difference between 2-butyne and 1-butyne ? By which test we can distinguish between these two ?

View Text Solution

107. Which real product is obtaine on hydrolysis of alkyne ? Why ?

View Text Solution

108. Give the structure and IUPAC name :

(a) Vinyl chloride (b) Vinyl cyanide

(c) Glyoxal (d) Silver acetilide

(e) Diacetyl (f) Glycol

View Text Solution

109. Give the isomers of aromatic hydrocarbon havig molecular formula of C_8H_{10}.

View Text Solution

110. Is given structure are of benzene ?

View Text Solution

111. What type of difference is observed in hybridization of carbon of benzene during nitration and formaiton of 6 complex ?

View Text Solution

112. Which type of reaction occurred between $H_2SO_4 - HNO_3$ in nitration ?

View Text Solution

113. Why m-dinitrobenzene is obtained from $C_6H_5NO_2$?

View Text Solution

114. Give reason : Nitration of benzene is not possible with only HNO_3.

View Text Solution

115. Which products are obtained on reaction of but-1-ene with HBr in presence of peroxide ?

View Text Solution

116. Which of the following shows geometrical isomers ?

A. $CH_2 = CHCl$

B. $CH_3CH = CH_2$

C. $CHCl = CHCl$

D. $(CH_3)_2C = CHC_2H_5$

Answer: C

View Text Solution

117. Which of the following has activation effect on benzene ring ?

$-OH,\ -COCH_3,\ -NO_2,\ -NH_2,\ -Cl,\ -Br,\ -NHCOCH_3,\ -C$

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118. Which of the above group has deactivator groups ?

View Text Solution

119. Arrange the following group in increasing order of nitration reaction

:

$C_6H_6, H_6H_5Cl, C_6H_5COOH, C_6H_5NH_2$

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120. Arrange the following compounds in decreasing order of their reactivity order with E^+ :

$C_6H_5NH_2, C_6H_5NHCOCH_3, C_6H_6, C_6H_5SO_3H$

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121. Arrange the following compounds in decreasing order of acidic character of CH. $CH_2 = CH_2, CH_3 - CH_3, C_6H_6, CH \equiv CH$

View Text Solution

122. Which of the following compound does not react with $NaNH_2$? Why ?

$CH_3 \equiv CCH_3, CH_3CH_2C \equiv CH,$

$C_2H_5C \equiv CC_2H_5, HC \equiv CH, CH_3CH = CH_2,$

$CH_2 = CH - C \equiv CH$

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123. Which of the following group possess m-directional effect ?

$-OH,\ -OCH_3,\ -Cl,\ -NO_2,\ -COOH,\ -NHCOCH_3,\ -SO_3H,$

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124. All ortho and para directional group are activator ? Give examples.

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125. Give nitration products of toluene and benzoic acid ?

View Text Solution

126. Give bond length between C-C of ethane, ethene, ethyne and benzene.

View Text Solution

127. What is the hybridization of carbon in above compounds ?

View Text Solution

128. Give shape and bond angle of the compounds of questions.

View Text Solution

129. What is the shape of π-electron cloud in ethene and benzene ?

View Text Solution

130. Ethene, ethyne and benzene gives electrophilic reactions, why ? Give reasons.

View Text Solution

131. Alkene and alkyne gives electrophilic addition reaction, while benzene gives electrophilic substitution reaction. Give reason.

View Text Solution

132. Which orbitals are involved in bond overlapping of each carbon in benzene ?

View Text Solution

133. Which are the cancer causing compounds ?

View Text Solution

134. Give conversion reaction of benzene in the following products :

(i) Nitrobenzene (ii) Chlorobenzene

(iii) Bromobenzene

(iv) Benzene sulphonic acid (v) Toluene

(vi) Ethyl benzee and (vii) Acetophenone

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135. Give resonance structures of following :

(i) Phenol (ii) Nitrobenzene

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136. Give chemical reactions for the following :

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137. Give structures of following :

(i) Glycol (ii) Glyoxal

(iii) Ethanal and Ethanol

(iv) Propanal, Propanol and Propanone

(v) Gem-dibromide (Two)

(vi) Vicinal dibromide (Two)

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138. Give ozonized structure for following :

(i) Propene (ii) Ethene (iii) 1-butene

(iv) 2-butene (v) Benzene (vi) Buta-1,3-diene

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139. Give stability order of carbocations :

(i) $(CH_3)_3\overset{+}{C}, (CH_3)_2\overset{+}{C}H, CH_3\overset{+}{C}H_2, \overset{+}{C}H_3$

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140. $CH_3CH_2\overset{+}{C}HCH_3$, $CH_3CH_2CH_2\overset{+}{C}H_2$

$CH_3 - \underset{\underset{CH_3}{|}}{C}HCH_2\overset{+}{C}H_2$, $CH_3 - \underset{\underset{CH_3}{|}}{\overset{+}{C}}\ CH_2CH_3$

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141. Give chemical formula, name and structure of gamexene.

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142. Give structure and formula of hexachloro benzene.

View Text Solution

143. Give chemical formula and structure of acetophenone.

View Text Solution

144. How many σ and π bonds are present in acetophenone ?

View Text Solution

145. Give structure of nitro and sulphonic acd group.

View Text Solution

146. Bromination of phenol gives tribromophenol while bromination of nitrobenzene gives only one bromonitrobenzene, why ?

View Text Solution

147. Give name of 4 compounds of polymerized substance. And give their polymer name.

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Section B Fill In The Blanks

1. Stronger deactivator group is ..... .

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2. Highest acidic hydrogen possessing group among C_2H_2, C_2H_4, C_2H_6 and C_2H_6 is .....

View Text Solution

3. .....product obtained from the chlorination of benzene sulphonic acid in presence of $FeCl_3$.

View Text Solution

4. $(CH_3)CHCH_2-$ and $CH_3CH_2CH_2$ have same ..... and ..... respectively.

View Text Solution

5. $CH_3CH_2CH_2\overset{+}{C}H_2$ and $CH_3-\underset{\underset{CH_3}{|}}{C}H\overset{+}{C}H_2$ is ..... and ..... Is more stable.

View Text Solution

6. ..... charge produce in phenol ring by resonance but due to resonance in nitrobenzene ..... charge is produce on ring.

View Text Solution

7. Br^+, N^+H_4 and N^+O_2 all three possess positive charge, ... is not electrophilic in nature.

View Text Solution

8. According to anti Markovnikov, $CH_3CH=CH_2$ is react with HBr in presence of .....

View Text Solution

9. The sigma bond formed between two carbon of ethene is result of overlapping of ..... hybridized orbital.

View Text Solution

10. If C_4H_8 is not alkene then this compound is .....

View Text Solution

11. Weakest acid among $CH_4COOH, CH_2ClCOOH, CHCl_2COOH$ is .....

View Text Solution

12. Benzene gives ..... type of reaction easily.

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Section B State True Or False For The Following Statements

1. Benzene is aromatic because .....

(i) it has six carbon.

(ii) all carbon has sp^2 hybridization.

(iii) it has three C=C.

(iv) it has more proportion of carbon and less proportion of hydrogen.

(v) it is planner in nature.

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2. What is true and false for the ethene from the following ?

(i) Ethene molecule is three dimensional

(ii) Ethene is planar

(iii) Ethene has four hydrogen

(iv) Ethene has sp carbon.

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3. Ozonization of propene gives .....

(i) ethanol and methanal

(ii) ethanol and methanol.

(iii) hybridization of carbon is change.

(iv) propene gives monotriozonied.

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4. In propyne .....

(i) sp hybridization in two carbon atoms.

all carbon has sp hybridization.

(iii) one carbon has sp^3 hybridization.

(iv) all C-H bonds are of σ type.

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5. In resonance structure of phenol.....

(i) lone pair of electron of oxygen atom of -OH group is transferred to benzene ring.

(ii) ti gives resonance structures having lone pair of electrons in second, fourth and sixth position of -OH group.

(iii) structure with negative charge & 1 electron pair on third position of -OH group.

(iv) phenol becomes polar.

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6. Electrophilic substitution reaction of benzene.....

(i) $\overset{+}{N}O_2$ electrophile in nitration but SO_3 in sulphonation.

(ii) Cl is electrophile in chlorination.

(iii) Br is electrophile in bromination

(iv) R^+ is electrophile in FC alkylation.

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7. For isomerism.....

(i) Geometrical isomers are possible for CHCl=CHCl.

(ii) $CH_2 = CHCl$ has two isomers.

(iii) $C_6H_4Cl_2$ has three isomers.

(iv) No isomers for chlorobenzene.

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8. For reaction of (Propene + HBr)....

(i) 2-bromopropane is obtained on reaction of HBr with propene.

(ii) 2-bromopropane is obtained as main product on reaction of HBr with propene in presence of peroxides.

(iii) 1-bromopropane is obtained as main product on reaction of HBr with propene in presence of peroxides.

(iv) Propene does not react with propene.

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9. For benzene.....

(i) Benzene does not give addition reaction.

(ii) Benzene gives characteristic electrophilic substitution reaction.

(iii) Benzene is planner molecule.

(iv) There is no double bond or single bond present in benzene.

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10. For types of reaction mechanism....

(i) reaction of propene with HBr in presence of peroxide is not a type of free radical addition reaction.

(ii) chlorination of methane in presence of sunlight is a kind of free radical substitution reaction.

(iv) dehydration of propanol is a kinf of β-elemination reaction.

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11. Find out true (T) and false (F) for the following statements.

(i) Propane ,2-diol is obtained as a oxidized product in bayer's test of propene.

(ii) Ethanal is obtained as reduced product in ozonolysis of propene.

(iii) Tertairy butyl alcohol is obtained on oxidaiton of 2-methyl propane by $KMnO_4$.

(iv) Oxidation is not possible for alkane like 2-methyl propane.

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Section B Assertion And Reason Type Questions

1. Statement (S) : Nitration of toluene is occur on ortho and para position.

Reason (R) : $-CH_3$ group in toluene is ortho and para directing in nature.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is wrong and reason (R) is right

Answer: A

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2. Statement (S) : For nitration of chlorobenzene more heating is required in comparision of benzene.

Reason (R) : -Cl groups is deactivator in chloro-benzene.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is wrong and reason (R) is right

Answer: A

View Text Solution

3. Statement (S) : For chlorination of benzene $FeCl_3$ is also required along with Cl_2.

Reason (R) : Chlorination is carried out by Cl of $FeCl_3$.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is right and Reason (R) is wrong

Answer: D

View Text Solution

4. Statement (S) : Both -OH and $-NH_2$ are m-directing in nature.

Reason (R) : Both -OH and $-NH_2$ donate their lone pair electrons to the benzene ring in resonance.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is wrong and reason (R) is right

Answer: D

View Text Solution

5. Statement (S) : Chlorination of toluene gives mixtures of ortho and para chloro toluene.

Reason (R) : $-CH_3$ group is presenet in toluene.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is wrong and reason (R) is right

Answer: B

View Text Solution

6. Statement (S) : $-CH_3$ group possess ortho and para directing effect.

Reason (R) : $-CH_3$ group donate its electro pair and negative charge on

ortho and para position.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is wrong and reason (R) is right

Answer: A

View Text Solution

7. Statement (S) : Substitution reactions of benzene is quite difficult with respect to addition reaction.

Reason (R) : Addition products does not possess resonating stability and aromatic.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is wrong and reason (R) is right

Answer: A

View Text Solution

8. Statement (S) : Electrophilic susbtitution reaction of benzene is very difficult.

Reason (R) : Delocalized 3π electron clouds are presenet in benzene ring.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is wrong and reason (R) is right

Answer: B

View Text Solution

9. Statement (S) : Ethene can perform electrophilic reactions easily with respect to ethane.

Reason (R) : There is no π- electron in ethane.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is wrong and reason (R) is right

Answer: B

View Text Solution

10. Statement (S) : For chlorination of methane constant ultraviolet rays are required.

Reason (R) : In termination step of reaction mechanism free radicals are attached.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is wrong and reason (R) is right

Answer: A

View Text Solution

11. Statement (S) : Isomers are not possible for ethane.

Reason (R) : There is a double bond between two carbon atom.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is wrong and reason (R) is right

Answer: C

View Text Solution

12. Statement (S) : Trans ethane is more stable than cis ethane.

Reasons (R) : Distortion is present in ethane but it is not present in trans.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is wrong and reason (R) is right

Answer: A

View Text Solution

13. Statement (S) : There is no geometrical isomers for $CH_2 = CHCl$.

Reason (R) : There is only one π-bond exist between two carbon of $CH_2 = CHCl$.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is wrong and reason (R) is right

Answer: B

View Text Solution

14. Statement (S) : Cis and trans geometrical isomers of $CH_3CH = CHCH_3$ is possible.

Reason (R) : Free radical rotation surrounding carbon-carbon double bond is not possible in $CH_3CH = CHCH_3$.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is wrong and reason (R) is right

Answer: A

View Text Solution

15. Statement (S) : Polarity of cis isomer is more with respect to trans isomers.

Reason (R) : Cis and trans isomers are geometrical isomers.

A. Both statement (S) and Reasons (R) are true. And (R) gives complete explanation of (S).

B. Both statement (S) and Reasons (R) are true. But (R) does not gives complete explanation of (S).

C. Both statement (S) and Reason (R) are wrong

D. Statement (S) is wrong and reason (R) is right

Answer: B

View Text Solution

Section C Multiple Choice Questions Mcqs

1. Which of the following possess tertiary carbon ?

A. Propane

B. n-butane

C. 2-methyl propane

D. 2,2-dimethylpropane

Answer: C

View Text Solution

Section C Multiple Choice Questions Mcqs

1. Which of the following is sodalime ?

A. KOH, CaO

B. $Ca(OH)_2, NaOH$

C. $H_2O, NaOH$

D. $NaOH, CaO$

Answer: D

View Text Solution

2. Which of the following has common formula C_nH_{2n} ?

A. Alkane

B. Alkene

C. Alkyne

D. Cycloalkene

Answer: B

View Text Solution

3. Which of the following is Lynder's catalyst ?

A. Ni + pt

B. CaO . NaOH

C. Pd+C

D. $Pt + H_2$

Answer: C

View Text Solution

4. Which of the following is saturated hydrocarbon ?

A. Ethene

B. Propane

C. Ethyne

D. Butyne

Answer: B

View Text Solution

5. Which of the following type of hydrogen is not possible ?

A. 3°

B. 2°

C. 4°

D. 1°

Answer: C

View Text Solution

6. 4° hydrogen is not possible, give reasons.....

A. Carbon has four covalent bond.

B. Centre carbon is attach with other four carbon and so there is no valence for attachement of hydrogen

C. $1^{\circ}, 2^{\circ}$ and 3° carbon are stable but 4° carbon is unstable.

D. Free radical is formed with 4° carbon.

Answer: B

View Text Solution

7. Which of the following is true for structure given in Group A with Group -B find correct option.

A. (i-s), (ii-p), iii-r), (iv-q)

B. (i-p), (ii-q), (iii-r), (iv-s)

C. (i-p),(ii-p), (iii-q), (iv-r)

D. (i-p), (ii-p), (iii-q), (iv-r)

Answer: C

View Text Solution

8. C-C σ bond enthalpy of ethane is 397 KJ mol^{-1} and C-C π-bond enthalpy in ethene is 284 kJ mol^{-1}. So what is the bond enthalpy of double bond in kJ mol^{-1} in ethane ?

A. 384

B. 823

C. 681

D. 284

Answer: C

View Text Solution

9. What is the single bond, double bond and triple bond enthalpy in ethane, ethene and ethyne respectively in kJ mol^{-1} ?

A. 681, 384, 823

B. 384, 681, 823

C. 823, 681, 384

D. None of the above

Answer: B

View Text Solution

10. Find correct chemical reactivity order for the (a) ethane (b) ethee and (c) ethyne

A. $(a) > (b) > (c)$

B. $(c) > (b) > (a)$

C. $(a) > (c) > (b)$

D. $(c) > (a) > (b)$

Answer: B

View Text Solution

11. What is the correct order for boiling point having same carbon in alkane, alkene and alkyne ?

A. Alkane $>$ Alkene $>$ Alkyne

B. Alkyne $<$ Alkene $<$ Alkane

C. Alkene $<$ Alkane $<$ Alkyne

D. Alkane $<$ Alkyne $<$ alkene

Answer: A

View Text Solution

12. Which of the following compound possess geometrical isomerism ?

A. Alkane

B. Alkene

C. Alkyne

D. None of these

Answer: B

View Text Solution

13. Which of the following is not benzenoid ?

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

14. Which of the followng product can be obtained on reaction of benzene with chlorine in presence of anhydrous $AlCl_3$?

A. Chlorobenzene

B. Hexachlorocyclohexane

C. Benzene hexachloride

D. None of these

Answer: A

View Text Solution

15. Which of the following reactant can react with benzene ?

A. I_2 and sunlight (Normal temperature)

B. With cold $KMnO_4$

C. With bromine water

D. With bromine $+FeBr_3$

Answer: D

View Text Solution

16. Which scientist has obtained benzene first ?

A. Kekule

B. Friedel-Craft

C. Michal Ferade

D. August Hoffman

Answer: C

View Text Solution

17. Which of the following has highest boiling point ?

A. Neo-pentane

B. n-pentane

C. Iso-pentane

D. n-hexane

Answer: D

View Text Solution

18. Propene $+ X \xrightarrow{(C_6H_5CO)_2OO}$ 1-halopropene, then what is 'X' ?

A. HI

B. HCl

C. HBr

D. All of the given

Answer: C

View Text Solution

19. $X + \text{water} \rightarrow$ ethyne, so what is compound X?

A. Sodium carbide

B. Sodium ethenide

C. calcium carbide

D. Calcium oxide

Answer: C

View Text Solution

20. One following reaction which product is formed

$HC \equiv CH + NaNH_2 \xrightarrow{NaNH_3}$?

A. $HC \equiv CNa$

B. $NaC \equiv CNa$

C. H_2

D. All of the given

Answer: D

View Text Solution

21. o-xylene, m-xylene and p-xylene are isomers of each other. What type of isomerism they possess ?

A. Functional group isomerism

B. Chain isomerism

C. Position isomerism

D. Geometrical isomerism

Answer: C

View Text Solution

22. In nitration of benzene .....is electrophile.

A. Nitrate ions

B. Nitrite ions

C. Nitronium ions

D. Nitro

Answer: C

View Text Solution

23. If on electrophilic substitution reaction of C_6H_5Y gives m $-NO_2C_6H_4Y$ then what is not y form the following ?

A. $-NH_2$

B. $-NO_2$

C. $-COOH$

D. $-SO_3H$

Answer: A

View Text Solution

24. Which of the following does not possess zero magnetic momentum ?

A. Transvinly chloride

B. p-xylene

C. cis-but-2-ene

D. Methane

Answer: C

View Text Solution

25. Benzene burns with sooty flame in burner, because....

A. it is aliphatic compound

B. it is aromatic

C. it is cyclic compound

D. due to resonance effect

Answer: B

View Text Solution

26. Which main product is obtained when 3-methyl-pent-2-ene react with HBr in presence of peroxides ?

A. 3-bromo-3-methylpetane

B. 4-bromo-3-methylpentane

C. 2-bormo-3-methylpentane

D. All of these

Answer: D

View Text Solution

Section C Mcqs Asked In Competitive Exam

1. The decreasing order of boiling points is

A. n-pentane $>$ iso-pentane $>$ neo-pentane

B. iso-pentane $>$ n-pentane $>$ neo-pentane

C. neo-pentane $>$ iso-pentane $>$ n-pentane

D. n-pentane $>$ neo-pentane $>$ iso-pentane

Answer: A

View Text Solution

2. In the preparation of Grignard reagent from haloalkane, the metal used is

A. Mg

B. Zn

C. Li

D. K

Answer: A

View Text Solution

3. Soduim acetate can be converted to ethane by

A. Heating with $LiAlH_4$

B. Electrolysis its aqueous solution

C. Heating with sodalime

D. Heating with calcium acetate

Answer: B

View Text Solution

4. In the reaction $CH_3 - Br + 2Na + Br - CH_3 \rightarrow$, the reaction is called

A. Wurtz reaction

B. Aldol condensation

C. Perkin's reaction

D. Levit reaction

Answer: A

View Text Solution

5. In Wurtz reaction, the reagent used is

A. Na

B. Na/Liquid NH_3

C. Na/dry ether

D. Na/dry alcohol

Answer: C

View Text Solution

6. Which of the following has highest octane number

A. n-hexane

B. n-heptane

C. n-pentane

D. 2,2,-4-trimethyl pentane

Answer: D

View Text Solution

7. n-hexadecane has cetane number

A. 90

B. 100

C. 110

D. zero

Answer: B

View Text Solution

8. Petroleum refining is

A. distillation of petroleum to get different fractions.

B. obtaining aromatic compounds from aliphatic compounds present in petroleum.

C. cracking of petroleum to get gaseous hydrocarbons.

D. purifications of petroleum.

Answer: A

View Text Solution

9. The chemical added to leaded petrol to prevent the deposition of lead in the combustion chamber is

A. Iso-octane

B. Ethylene dibromide

C. Tetraethyl lead

D. Mercaptan

Answer: B

View Text Solution

10. Which of the following is not formed by the reaction of Cl_2 on CH_4 in sunlight ?

A. $CHCl_3$

B. CH_3Cl

C. CH_3CH_3

D. $CH_3CH_2CH_3$

Answer: D

View Text Solution

11. Alkenes usually show which type of reaction

A. Addition

B. Substitution

C. Elimination

D. Superposition

Answer: A

View Text Solution

12. Towards electrophilic reagents

A. ethene is more reactive then ethyne

B. ethene is less reactive than ethyne

C. both have equal reactivity

D. the reactivity of both cannot be predicted.

Answer: A

View Text Solution

13. The final product formed when ethyl bromide is treated with excess of alcoholic KOH is

A. Ethylene

B. Ethane

C. Ethyne

D. Vinyl bromide

Answer: A

View Text Solution

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

A. $CH_3\dot{C}HCH_2Cl$

B. $CH_3\overset{+}{C}HCH_3$

C. $CH_3CH_2\dot{C}H_2$

D. $CH_3CH_2\overset{+}{C}H_2$

Answer: B

View Text Solution

15. $CH_2 = CH_2 \xrightarrow[KOH\,/\,H_2O]{KMnO_4} X$. Product 'X' in above reaction is

A. Ethylene glycol

B. Glucose

C. Ethanol

D. All of these

Answer: A

View Text Solution

16. The test for unsaturations is confirmed by the decolourisation of which of the following.

A. Iodine water

B. $CuSO_4$ solution

C. Bromie water

D. All of these

Answer: C

View Text Solution

17. Which of the following compound is produced when $CH_2 = CH - (CH_2)_2COOH$ reacts with HBr in presence of peroxides

A. $CH_3CH(CH_2)_5COOH$

B. $BrCH_2CH_2(CH_2)_5COOH$

C. $CH_3CH_2CH_2(CH_2)_5COOH$

D. $CH_3CH_2BrCH_2CH_2COOH$

Answer: B

View Text Solution

18. 1,3-butadiene reacts wwith ethylene to form

A. Benzene

B. Cyclohexane

C. Cyclohexene

D. 2,3-Dimethyl butane

Answer: C

View Text Solution

19. In paraffins, with the increasing molecular weight, it is found that

A. Freezing point decreases

B. Boiling poing decreases

C. Boiling poing increases

D. Vapour pressure decreases

Answer: C

View Text Solution

20. A gas formed by the action of alcohlic KOH on ethyl iodide, decolourless alkaline $KMnO_4$ solution. The gas is

A. CH_4

B. C_2H_6

C. C_2H_4

D. C_2H_2

Answer: C

View Text Solution

21. Which of the following gases is used for welding

A. Methane

B. Ethane

C. Acetylene

D. Ethene

Answer: C

View Text Solution

22. 1-butylene reacts with cold alkaline $KMnO_4$ to produce

A. CH_3CH_2COOH

B. $CH_3CH_2CH_2COOH$

C. $CH_3CH_2COOH + CO_2$

D. $CH_3CH_2COOH + HCOOH$

Answer: C

View Text Solution

23. Acetylenic hydrogens are acidic because

A. Sigma electron density of C-H bond in acetylene is nearer to carbon, which has 50% s-character.

B. Acetylene has ony one hydrogen on each carbon.

C. Acetylene contains least number of hydrogens among the possible hydrocarbons having two carbons

D. Acetylene belongs to the class of alkynes with molecular formula C_nH_{2n-2}

Answer: A

View Text Solution

24. Poisonous has 'Lewisite' is obtained by the reaction of

A. $CH \equiv CH$ and $AsCl_3$

B. $CH_2 = CH_2$ and $AsCl_3$

C. $CH \equiv CH$ and S_2Cl_2

D. $CH_2 = CH_2$ and NOCl

Answer: A

View Text Solution

25. Hydrocarbon containing following bond is most reactive

A. $C \equiv C$

B. $C = C$

C. C-C

D. All of these

Answer: A

View Text Solution

26. Acetylene gives

A. White precipitate with $AgNO_3$ and red precipitate with Cu_2Cl_2

B. White precipitate with Cu_2Cl_2 and red precipitate with $AgNO_3$

C. White precipitate with both the reagents

D. Red precipitate with both the reagents

Answer: A

View Text Solution

27. When propyne reacts with aqueous H_2SO_4 in the presence of $HgSO_4$, the major product is

A. Propanal

B. Propyl hydrogen sulphate

C. Acetone

D. Propanol

Answer: C

View Text Solution

28. Which of the following is used to distinguish ethylene and acetylene.

A. Alkaline $KMnO_4$

B. Bromine water

C. Ammonical cuprous chloride

D. Conc. H_2SO_4

Answer: C

View Text Solution

29. The reaction of propene with HOCl proceeds via the addition of

A. H^+ in the first step

B. Cl^+ in the first step

C. OH^- in the first step

D. Cl^+ and OH^- in a single step

Answer: D

View Text Solution

30. Acetylene reacts with ammonical $AgNO_3$ forming

A. Silver acetylene

B. Silver acetate

C. Metal silver

D. Silver mirror

Answer: A

View Text Solution

31. The function of anhydrous $AlCl_3$ in the Friedel-Crafts reaction is to

A. Absorb water

B. Absorb HCl

C. To produe electrophile

D. To produce nuclephile

Answer: C

View Text Solution

32. Meta-directing and deactivating group in aromatic electrophilic substitution is

A. $-CH_3$

B. $-OH$

C. $-NO_2$

D. $-Cl$

Answer: C

View Text Solution

33. The ratio of σ and π bonds in benzene is

A. 2

B. 4

C. 6

D. 8

Answer: B

View Text Solution

34. Carbon atoms in benzene molecule is inclined at an angle of

A. 120°

B. 180°

C. $109^\circ 28'$

D. 60°

Answer: A

View Text Solution

35. $C_6H_6 + CH_3Cl \xrightarrow[AlCl_3]{\text{Anhydrous}} C_6H_5CH_3 + HCl$ is an example of

A. Friedel-Craft's reaction

B. Kolbe's synthesis

C. Wurtz reaction

D. Grignard reaction

Answer: A

View Text Solution

36. Napthalene is a/an

A. Ionic solid

B. Covalent solid

C. Metallic solid

D. Meolcular solid

Answer: D

View Text Solution

37. $CH \equiv CH + HBr \rightarrow X$, product X is

A. Ethylene bromide

B. Vinyl bromide

C. Bromo ethane

D. Ethyledine bromide

Answer: B

View Text Solution

38. The addition of HBr is easiest with

A. $Cl_2C = CHCl$

B. $ClCH = CHCl$

C. $CH_3 - CH = CH_2$

D. $(CH_3)_2C = CH_2$

Answer: D

View Text Solution

39. In ethylene, carbon monoxide and water is heated at high temperature, which of the following if formed

A. $C_4H_8O_2$

B. C_2H_5COOH

C. CH_3COOH

D. $CH_2 = CH - COOH$

Answer: B

View Text Solution

40. The decreasing order of acidic character among ethane (I), ethene (II), ethyne (III) and propyne (IV) is

A. $(I) > (II) > (III) > (IV)$

B. $(II) > (III) > (I) > (IV)$

C. $(III) > (IV) > (II) > (I)$

D. $(IV) > (III) > (II) > (I)$

Answer: C

View Text Solution

Section C Mcqs Asked In Board Exam

1. Which mixture is used as Lindlar's catalyst ?

A. Pd+Charcoal

B. Ni+P

C. Pt+Halogen

D. Pd+Pt

Answer: A

View Text Solution

2. Which of the following is strong reducing agent ?

A. Al_2O_3

B. BF_3

C. $LiAlH_4$

D. $AlCl_3$

Answer: C

View Text Solution

3. Which is the correct structure of TNT from the following ?

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

4. What will be the total no. of isomers of an acylic saturated hydrocarbon having molecular mass 72g/mol ?

A. 3

B. 4

C. 5

D. 2

Answer: A

View Text Solution

5. Which of the reagent is used in Kharash effect ?

A. HI

B. HCl

C. HBr

D. HF

Answer: C

View Text Solution

6. Which substance has fruity sweet smell ?

A. Pent-1-ene

B. Propene

C. But-1-ene

D. Ethene

Answer: D

View Text Solution

7. The number of σ and π bonds in phenol respectively are .....

A. 12,3

B. 13,4

C. 13,2

D. 13,3

Answer: D

View Text Solution

8. The molecular formula of Napthacene is .....

A. $C_{18}H_{10}$

B. $C_{18}H_{12}$

C. $C_{14}H_{28}$

D. $C_{18}H_{14}$

Answer: B

View Text Solution

9. Which compound with react with Zn to form 2-butene ?

A. 2,3-dibromobutane

B. 1-2,-dibromobutane

C. 2-butyne

D. none of these

Answer: A

View Text Solution

10. The catalyst used for obtaining carbonyl compound from alkyne during hydration is .....

A. HCN

B. $HgSO_4$

C. $HgCl_2$

D. Pt

Answer: B

View Text Solution

11. The hybrid state of Carbon in Acetylene is same as that of .....

A. Graphite

B. BeH_2

C. Benzene

D. Diamond

Answer: B

View Text Solution

12. Which of the following hydrocarbon cannot have cyclic type ?

A. Alkane

B. Alkene

C. Alkyne

D. Arene

Answer: A

View Text Solution

13. Which of the following substitution reaction of alkane is reversible ?

A. Fluorination

B. Chlorination

C. Bromination

D. Iodination

Answer: D

View Text Solution

14. What will be the number of σ and π bonds in Biphenyl respectively ?

A. 12σ and 6π

B. 22σ and 6π

C. 23σ and 6π

D. 13σ and 6π

Answer: C

View Text Solution

15. What will be the main product obtained during hydrobromination of Pent-1-ene in presence of Benzoyl peroxide ?

A. 1-bromo pentane

B. 2-bromo pentane

C. 3-bromo pentane

D. 2-methyl, 1-bromo butane

Answer: A

View Text Solution

16. Which mixture is used as Lindlar's catalyst ?

A. Pt+Charcoal

B. Pd+Halogen

C. Pt+Halogen

D. Pd+Charcoal

Answer: D

View Text Solution

17. Friedel-Craft's reaction of Toluene with ethanoic ahydride produces

A. Acetophenone

B. Methyl benzene

C. Ethyl benzene

D. p-methyl acetophenone

Answer: D

View Text Solution

18. Give IUPAC name of $(CH_3)_3C.C \equiv C.C(CH_3)_3$.

A. Di(tri methyl)but-2-yne

B. 3,3,4,4-tetramethylhex-3-yne

C. 2,2,5,5-tetramethylhex-3-yne

D. 2,2,5,5-tetramethylhex-4-yne

Answer: C

View Text Solution

19. Which of the following is used catalyst in preparation of PVC ?

A. Hg_2Cl_2

B. $HgCl_2$

C. Hg

D. $HgSO_4$

Answer: B

View Text Solution

20. Which of the following compounds possesses 3° carbon atom ?

A. 1-Chloro butane

B. n-Butane

C. Cyclo butane

D. Iso butane

Answer: D

View Text Solution

21. How many carbon atoms are sp^3 hybridized in but-2-en ?

A. 4

B. 2

C. 3

D. 1

Answer: B

View Text Solution

22. With which reactant ethylene will react to form vinly cyanide ?

A. HCN

B. KCN

C. $HgCl_2$

D. NaCN

Answer: A

View Text Solution

23. Write IUPAC name of Parachloro toluene.

A. 1-chloro-2-methyl benzene

B. 2-chloro-4-methyl benzene

C. 4-chloro-2-methyl benzene

D. 1-chloro-4-methyl benzene

Answer: D

View Text Solution

24. Which of the following functional groups passes on electron towards the phenyl ring ?

A. $-SO_3H$

B. $-CHO$

C. $-Cl$

D. $-NO_2$

Answer: C

View Text Solution

25. Possible number of cyclic isomers for the compound having molecular formula $C_6H_4Cl_2$ is ..... .

A. 6

B. 4

C. 5

D. 3

Answer: D

View Text Solution

26. How many σ (sigma) and π (pi) bonds are present in benzoic acid ?

A. $14\sigma, 4\pi$

B. $14\sigma, 3\pi$

C. $15\sigma, 3\pi$

D. $15\sigma, 4\pi$

Answer: D

View Text Solution

27. Which of the following metals is not used as a catalyst in addition reaction of alkyne ?

A. Ni

B. Pd+Halogen

C. Mn

D. Pt

Answer: C

View Text Solution

28. How many benzene rings are there in the structural formula of Napthacene ?

A. 5

B. 3

C. 4

D. 2

Answer: C

View Text Solution

29. Which of the following reagents is used for decarboxylation of carboxylic acid ?

A. $NaHCO_3 + KCl$

B. $NaHCO_3 + NaCl$

C. $NaOH + CaO$

D. $NaOH + MgCl_2$

Answer: C

View Text Solution

30. Which gas is relesed during the reaction of Sodalime with Ethylene ?

A. Nitrogen

B. Hydrogen

C. Ammonia

D. Ethene

Answer: C

View Text Solution

31. Which of the following is Lindlar's catalyst ?

A. Pd+Pt

B. Ni+P

C. Pt+Charcoal

D. Pd+Charcoal

Answer: D

View Text Solution

32. The number of σ and π bonds present in cis-but-2-ene is ..... .

A. 9σ and 1π

B. 5σ and 1π

C. 11σ and 1π

D. 8σ and 1π

Answer: C

View Text Solution

33. BF_3 is used as a catalyst in Friedel-Craft alkylation and acylation reaction because it is a.....

A. Lewis acid

B. Lewis base

C. Nucleophile

D. Arrhenius base

Answer: A

View Text Solution

34. The reaction of n-hexane in presence of catalyst at 773 K and 10-20 bar pressure to form benzene is known as .....reaction.

A. Hydration

B. Hydrogenation

C. Dehydration

D. Dehydrogenation

Answer: D

View Text Solution

35. What is the value of Dipole moment (μ) for trans-but-2-ene ?

A. 2.5 D

B. 2.0 D

C. 0.00D

D. 0.33 D

Answer: C

View Text Solution

36. Which of the following compounds is non aromatic ?

A. 

B. 

C. 

D. 

Answer: B

View Text Solution

37. Which of the following group is not an electron withdrawing group ?

A. $-NO_2$

B. $-C_2H_5$

C. $-COOH$

D. $-CCl_3$

Answer: B

View Text Solution

38. Which of the following substance is in liquid form at room temperature ?

A. Methane

B. Hexane

C. Propane

D. Butane

Answer: B

View Text Solution

39. The isomer of Cyclopentane is..... .

A. Pent-1-ene

B. Pent-2-ene

C. 2-methyl but -1-ene

D. All the given three options

Answer: D

View Text Solution

Section C Mcqs Asked In Jee Neet Aieee

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

A. m-chlorobenzene

B. benzoyl chloride

C. benzyl chloride

D. o-and p-chlorotoluene

Answer: D

View Text Solution

2. The hydrocarbon which can react with sodium in liquid ammonia is

A. $CH_3CH_2C \equiv CCH_2CH_3$

B. $CH_3CH_2CH_2C \equiv CCH_2CH_2CH_3$

C. $CH_3CH_2C \equiv CH$

D. $CH_3CH = CHCH_3$

Answer: C

View Text Solution

3. The treatment of CH_3MgX with $CH_3C \equiv C - H$ produces

A. CH_4

B. $CH_3 - CH = CH_2$

C. $CH_3C \equiv C - CH_3$

D. $CH_3\overset{H}{\overset{|}{C}} = \overset{H}{\overset{|}{C}} - CH_3$

Answer: A

View Text Solution

4. The IUPAC name of the compound having the formula $CH \equiv C - CH = CH_2$ is

A. 1-butyn-3-ene

B. but-1-yne-3-ene

C. 1-butene-3-yne

D. 3-butene-1-yne

Answer: C

View Text Solution

5. Liquid hydrocarbons can be converted to a mixture of gaseous hydrocarbons by :

A. oxidation

B. cracking

C. distillation under reduced pressure

D. hydrolysis

Answer: B

View Text Solution

6. The IUPAC name of the compound $CH_3CH = CH \equiv CH$ is

A. Pent-1-yn-3-ene

B. Pent-4-yn-2-ene

C. Pent-3-en-1-yne

D. Pent-2-en-4-yne

Answer: D

View Text Solution

7. The total number of π-bond electrons in the following structure is :

A. 4

B. 8

C. 12

D. 16

Answer: B

View Text Solution

8. Given :

The enthalpy of hydrogeneation of these compounds will be in the order as :

A. $I > II > III$

B. $III > II > I$

C. $II > III > I$

D. $II > I > III$

Answer: B

View Text Solution

9. The enolic form of ethyl acetoacetate as below has :

A. 18 sigma bonds and 2 pi - bonds

B. 16 sigma bonds and 1 pi - bonds

C. 9 sigma bonds and 2 pi - bonds

D. 9 sigma bonds and 1 pi - bonds

Answer: A

View Text Solution

10. 2,3-Dimethyl-2-butene can be prepared by heating which of the following compounds with a strong acid ?

A. $(CH_3)_2C = CH - CH_2 - CH_3$

B. $(CH_3)_2CH - CH_2 - CH = CH_2$

C. $(CH_3)_2CH - \underset{\underset{CH_3}{|}}{CH} - CH = CH_2$

D. $(CH_3)_3C - CH = CH_2$

Answer: D

View Text Solution

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

A. 

B. 

C. 

D. (A) and (B)

Answer: D

View Text Solution

12. The oxidation of benzene by V_2O_5 in the presence of air produce :

A. benzoic acid

B. benzaldehyde

C. benzoic anhydride

D. maleic anhydride

Answer: D

View Text Solution

13. Which of the following is not the product of dehydration of  ?

A. 

B. 

C. 

D. 

Answer: D

View Text Solution

14. The reaction of propene with $HOCl(Cl_2 + H_2O)$ proceeds through the intermediate :

A. $CH_3 - CHCl - CH_2^+$

B. $CH_3 - CH^+ - CH_2 - OH$

C. $CH_3 - CH^+ - CH_2 - Cl$

D. $CH_3 - CH(OH) - CH_2^+$

Answer: B

View Text Solution

15. The correct statement regarding the comparison to staggered and eclipsed conformations of ethane is :

A. The eclipsed conformation of ethane is more stable than staggered conformation, because eclipsed conformation has no torsional strain.

B. The eclipsed conformation of ethane is more stane tha staggered conformation even though the eclipsed conformation has torsional strain.

C. The staggered conformation of ethane is more stane than eclipsed conformation, because staggered conformation has no tosional strain.

D. The staggered conformation of ethane is less stable than eclipsed conformation because staggered conformation has torional strain.

Answer: C

View Text Solution

16. In the reaction

$$H - C \equiv CH \xrightarrow[(ii)\, CH_3CH_2Br]{(I)\, NaNH_2/liq.NH_3} X \xrightarrow[(ii)\, CH_3CH_2Br]{(I)\, NaNH_2/liq.NH_3} Y$$ X and Y are .

A. X=2-Butyne , Y = 3-Hexyne

B. X=2-Butyne , Y = 2-Hexyne

C. X = 1-Butyne, Y = 2-Hexyne

D. X=1-Butyne, Y = 3-Hexyne

Answer: D

View Text Solution

17. Consider the nitration of benzene using mixed conc. H_2SO_4 and HNO_3. If a large amount of $KHSO_4$ is added to the mixture, the rate of nitration will be :

A. Slower

B. Unchanged

C. Doubled

D. Faster

Answer: A

View Text Solution

18. The correct increasing of trans-effect of the following species is :

A. $Br^- > Cn^- > HN_3 > C_6H_5^-$

B. $CN^- > Br^- > C_6H_5^- > NH_3$

C. $NH_3 > CN^- > Br^- > C_6H_5^-$

D. $CN^- > C_6H_5^- > Br^- > NH_3$

Answer: D

View Text Solution

19. Which of the following can be used as the halide component for Friedel-Craft's reaction ?

A. Chloroethane

B. Isopropyl chloride

C. Chlorobenzene

D. Bromobenzene

Answer: B

View Text Solution

20. In Which of the following molecules, all atoms are coplanar ?

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

21. Which of the following compounds shall not produced propene by reaction with HBr followed by elimination of direct only elimination reaction ?

A. $H_2C = C = O$

B. $H_3C - \overset{\overset{H_2}{|}}{\underset{\underset{H_2}{|}}{C}} - CH_2Br$

C. 

D. $H_3C - C - CH_2OH$

Answer: A

View Text Solution

22. In the given reaction  $\xrightarrow[0^\circ C]{HF} P$ the product P is :

A. 

B. 

C. 

D. 

Answer: A

View Text Solution

23. The compound that will react most readily with gaseous bromine has the formula

A. C_4H_{10}

B. C_2H_4

C. C_3H_6

D. C_2H_2

Answer: C

View Text Solution

24. Which of the following molecule possess least resonance stability ?

A. 

B. 

C. 

D. 

Answer: D

View Text Solution

25. Which of the following carbocations is expected to be most stable ?

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

26. Which of the following molecules represents the order of hybridisation sp^2, sp^2, sp, sp from left to right atoms ?

A. $CH_3 - CH = CH - CH_3$

B. $HC \equiv C - C \equiv CH$

C. $CH_2 = CH - CH = CH_2$

D. $CH_2 = CH - CH \equiv CH_2$

Answer: D

View Text Solution

27. Hydrocarbon (A) reacts with bromine be substitution to form an alkyl bromide which by Wurtz reaction is converted gaseous hydrocarbon

containing less than four carbon atoms. (A) is

A. CH_4

B. $CH \equiv CH$

C. $CH_3 - CH_3$

D. $CH_2 = CH_2$

Answer: A

View Text Solution

28. Which of the following compound gives easily sulphonation reaction ?

A. Benzene

B. Nitrobenzene

C. Toluene

D. Chlorobenzene

Answer: C

View Text Solution

29. The trans-alkenes are formed by the reduction of alkynes with :

A. $H_2 - Pd/cBaSO_4$

B. $NaBH_4$

C. Na/liq. NH_3

D. Sn-HCl

Answer: C

View Text Solution

30. The number of sigma (σ) and pi (π) bonds in pent-2-en-4-yne is .....

A. 13σ-bonds and no π-bonds

B. 10σ-bonds and no 3π-bonds

C. 8σ-bonds and no 5π-bonds

D. 11σ-bonds and no 2π-bonds

Answer: B

View Text Solution

31. The most suitable reagent for the following conversion, is :

$H_3C - C \equiv C - CH_3 \rightarrow$ 

A. $Hg^{2+} / H^+, H_2O$

B. Na/Liquid NH_3

C. H_2, Pd/C, quinoline

D. Zn/HCl

Answer: C

View Text Solution

32. The increasing order of rectivity of the following compounds towards aromatic electrophilic subtitution reaction is :

A. $D < B < A < C$

B. $A < B < C < D$

C. $D < A < C < B$

D. $B < C < A < D$

Answer: C

View Text Solution

33. The major products A and B in the following reactions are :

A. 

B. 

C. 

D. 

Answer: A

View Text Solution

Section D Ncert Exemplar Solution

1. Arrange the following in decreasing order of their boiling points.

(A) n-butane

(B) 2-methylbutane

(C) n-pentane

(D) 2,2-dimethylpropane

A. $A > B > C > D$

B. $B > C > D > A$

C. $D > C > B > A$

D. $C > B > D > A$

Answer: D

View Text Solution

2. Arrange the halogens F_2, Cl_2, Br_2, I_2 in order of their increasing reactivity with alkanes.

A. $I_2 < Br_2 < Cl_2 < F_2$

B. $Br_2 < Cl_2 < F_2 < I_2$

C. $F_2 < Cl_2 < Br_2 < I_2$

D. $Br_2 < I_2 < Cl_2 < F_2$

Answer: A

View Text Solution

3. The increasing order of reduction of alkyl halides with zinc and dilute HCl is .....

A. $R-Cl<R-I<R-Br$

B. $R-Cl<R-Br<R-I$

C. $R-I<R-Br<R-Cl$

D. $R-Br<R-I<R-Cl$

Answer: B

View Text Solution

4. The correct IUPAC name of the following alkane is

A. 3,6-Diethyl-2-methyloctane

B. 5-Isopropyl-3-ethyloctane

C. 3-Ethyl-5-isopropyloctane

D. 3-Isopropyl-6-ethyloctane

Answer: A

View Text Solution

5. The addition of HBr to 1-butene gives a mixture of products A, B and C.....

A. A and B as major and C as minor products

B. B as major, A and C as minor products

C. B as minor, A and C as major products

D. A and B as minor and C as major products

Answer: A

View Text Solution

6. Which of the following will not show geometrical isomerism ?

A. 

B. 

C. 

D. 

Answer: D

View Text Solution

7. Arrange the following hydrogen halides in order of their decreasing reactivity with propene.

A. $HCl > HBr > HI$

B. $HBr > HI > HCl$

C. $HI > HBr > HCl$

D. $HCl > HI > HBr$

Answer: C

View Text Solution

8. Arrange the following carbanions in order of their decreasing stability.

(A) $H_3C - C \equiv C^-$

(B) $H - C \equiv C^-$

(C) $H_3C - \overline{C}H_2$

A. $A > B > C$

B. $B > A > C$

C. $C > B > A$

D. $C > A > B$

Answer: B

View Text Solution

9. Arrange the following alkyl halides in decreasing order of the rate of - elimination reaction with alcoholic KOH.

(A) $H_3C - \underset{CH_3}{\overset{H}{\underset{|}{\overset{|}{C}}}} - CH_2Br$ (B) $CH_3 - CH_2 - Br$

(C) $CH_3 - CH_2 - CH_2 - Br$

A. $A > B > C$

B. $C > B > A$

C. $B > C > A$

D. $A > C > B$

Answer: D

View Text Solution

10. Which of the following reactions of methane is incomplete combustion ?

A. $2CH_4 + O_2 \xrightarrow{Cu\,/\,523K\,/\,100\text{atm}} 2CH_3OH$

B. $CH_4 + O_2 \xrightarrow{Mo_2O_3} HCHO + H_2O$

C. $CH_4 + O_2 \rightarrow C(s) + 2H_2O(l)$

D. $CH_2 + 2O_2 \rightarrow CO_2(g) + 2H_2O(l)$

Answer: C

View Text Solution

Section D Ncert Exemplar Solution Multiple Choice Questions Mcqs More Than One Correct Answer

1. Some oxidation reactions of emthane are given below. Which of them is/are controlled oxidation reactions ?

A. $CH_{4(g)} + 2O_{2(g)} \rightarrow CO_{2(g)} + 2H_2O_{(l)}$

B. $CH_{4(g)} + O_{2(g)} \rightarrow C_{(s)} + 2H_2O_{(l)}$

C. $CH_{4(g)} + O_{2(g)} \xrightarrow{Mo_2O_3} HCHO + H_2O$

D. $2CH_{4(g)} + O_{2(g)} \xrightarrow{\text{Cu/523/100 atm}} 2CH_3OH$

Answer: A::C::D

View Text Solution

2. Which of the following alkenes on ozonolysis give a mixture of ketones only ?

A. $CH_3 - CH = CH - CH_3$

B. $CH_3 - \underset{\underset{CH_3}{|}}{C} - CH = CH_2$

C. 

D. 

Answer: A::C::D

View Text Solution

3. Which are the correct IUPAC names of the following compound ?

$$\begin{array}{c} HC(CH_3)_2 \\ | \\ H_3C-CH_2-CH_2-CH-CH-CH_2-CH_2-CH_2-CH_2CH_3 \\ | \\ H_3C-CH-CH_2-CH_3 \end{array}$$

A. 5-Butyl-4-isopropyldecane

B. 5-Ethyl-4-propyldecane

C. 5-sec-Butyl-4-iso-propyldecane

D. 4-(1-methylethyl)-5-(1-methylpropyl)-decane

Answer: A::C::D

View Text Solution

4. Which are the correct IUPAC name of the following compound ?

A. 5-(2,2-Dimethylpropyl)-decane

B. 4-Butyl-2,2-dimethlnonane

C. 2,3-Dimethyl-4-pentyloctane

D. 5-Neo-pentyldecane

Answer: A::D

View Text Solution

5. For an electrophilic substitution reaction, the presence of a halogens atom in the benzene ring.

A. Deactivates the ring by inductive effect

B. Deactivates the ring by resonance

C. Increases the charge density at ortho and para position relative to meta position by resonance

D. Directs the incoming electrophilic to meta position by increasing the charge density relative to ortho and para position.

Answer: A::C::D

View Text Solution

6. In an electrophilic substitution reaction to nitrobenzene, the presence of nitro group.

A. Deactivates the ring by inductive effect

B. Activities the ring by inductive effect

C. Decreases the charge density at ortho and para position of the rinf relative to meta position by resonance.

D. Increases the charge density at meta position relative to the ortho and para positions of the ring by resonance.

Answer: A::C::D

View Text Solution

7. Which of the following are correct ?

A. $CH_3 - O - \overset{\oplus}{C}H_2$ is more stable than $CH_2 - \overset{\oplus}{C}H_2$

B. $(CH_3)_2\overset{\oplus}{C}H$ is less stable than $CH_3 - CH_2 - \overset{\oplus}{C}H_2$

C. $CH_2 = CH - \overset{\oplus}{C}H_2$ is more stable than $CH_3 - CH_2 - \overset{\oplus}{C}H_2$

D. $CH_2 = \overset{\oplus}{C}H$ is more stable than $CH_3 - \overset{\oplus}{C}H_2$

Answer: A::C::D

View Text Solution

8. Four structures are given in options (A) to (D), Examine them and selet the aromatic structure.

A. 

B. 

C. 

D. 

Answer: A::C::D

View Text Solution

9. The molecules having dipole moment are .....

A. 2,2-Dimethylpropane

B. trans-pent-2-ene

C. cis-hex-3-ene

D. 2,2,3,3-Tetramethylbutane

Answer: A::B::C::D

View Text Solution

Section D Ncert Exemplar Solution Short Answer Type

1. Why do alkenes prefer to udnergo electrophilic addition reaction while are nesprefer electrophonic substitution reactions ? Explain.

View Text Solution

2. Alkynes on reducton with sodium in liquid ammonia forms trans alkenes. Will the butene thus formed on reduction of 2-butyne show the geometrical isomerism ?

View Text Solution

3. Rotations around carbon-carbon single bond of ethane is not completely free. Justify the statement.

View Text Solution

4. Draw Newman and Sawhorse projections for the eclipsed and staggered conformation of ethane. Which of these conformation is more stable and why ?

View Text Solution

5. The intermediate carbocation formed in the reaction of HI, HBr and HCl with propene is the same and the bond energy of HCl, HBr and HI is $430.5kJmol^{-1}$, $363.7kJmol^{-1}$ and 296.8 kJ mol^{-1} respectively. What will be the order of reactivity of these halogen acids ?

View Text Solution

6. What will be the product obtained as a result of the following reaction and why ?

$CH_3 - CH_2 - CH_2Cl \xrightarrow{AlCl_3}$

View Text Solution

View Text Solution

7. How will you convert benzene in to

(a) p-nitrobromobenzene

(b) m-nitrobromobenzene

View Text Solution

8. Arrange the following set of compounds in the order of their decreasing relative reactivity with an electrophile. Give reasons.

View Text Solution

9. Despite their -I effect, halogens are o-and p-directing in haloarenes. Explain.

View Text Solution

10. Why does presence of a nitro group make the benzene ring less reactive in comparision to the unsubstituted benzene ring. Explain.

View Text Solution

11. Suggest a route for the preparation of nitrobenzene starting from acetylene ?

View Text Solution

12. Predict the major product(s) of the following reactions, and explain their formation.

$$H_3C - CH = CH_2 \xrightarrow[HBr]{(Ph-CO-O)_2}$$

$$H_3C - CH = CH_2 \xrightarrow{HBr}$$

View Text Solution

13. Nucleophiles and electrophiles are reaction intermediates having electron rich and electron deficient centres respectively. Hence, they tend to attack electron deficient and electron rich centres respectively. Classify the following species as electrohiles and nuclephiles.

(i) H_3CO^- (ii) $H_3C-\overset{\overset{O}{||}}{C}-O^-$

(iii) Cl (iv) Cl_2C:

(v) $(H_3C)_3C^+$ (vi) Br^-

(vii) H_3COH (viii) R-NH-R

View Text Solution

14. The relative reactivity of $1^\circ, 2^\circ, 3^\circ$, hydrogen's towards chlorination is 1:3.8:5. Calculate the percentage of all mono chlorinated products obtained from 2-methylbutane.

View Text Solution

15. Write the structure and names of products obtained in there actions of sodium with a mixture of 1-iodo-2-methylpropane and 2-iodopropane.

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16. Write hydrocarbon radicals that can be formed as intermediates during mono chlorination of 2-methylpropane ? Which of them is more stable ? Give reasons.

View Text Solution

17. An alkane C_8H_{18} is obtained as the only product on subjecting a primary alkyl halide to Wurtz reaction. On monobromination this alkane yields a single isomer of tertiary bromide. Write the structure of alkane and the tertiary bromide.

View Text Solution

18. The ring systems having following characteristics are aromatic.

(i) Planar ring containing conjugated π bonds.

(ii) Complete delocalization of the π-electrons in ring system i.e., each atom in the ring has unhybridized p-orbital, and

(iii) Presence of (4n+2) π-electrons in the ring where n-is an integer (n=0,1,2...) [Huckel. Using this information classify the following compounds as aromatic/non-aromatic

View Text Solution

19. Which of the following compounds are aromatic according to Huckel's rule ?

View Text Solution

20. Suggest a route to prepare ethyl hydrogen sulphate $(CH_3 - CH_2 - OSO_2 - OH)$ starting from ethanol (C_2H_5OH).

View Text Solution

Section D Ncert Exemplar Solution Matching Type Columns

1. Match there agent from Column-I which on reaction with $CH_3 - CH = CH_2$ gives some Product given in Column-II as per codes given below :

View Text Solution

2. Match the hydrocarbons in column-I with the boiling points given in column-II.

View Text Solution

View Text Solution

3. Match the following reactants in Column-I with the corresponding reaction products in Column-II.

View Text Solution

4. Match the following reactants in Column-I with the corresponding reaction products in Column-II.

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Section D Ncert Exemplar Solution Assertion And Reason Type

1. Assertion (A) : The compound cyclooctane has the following structural formula :

It is cyclic and has conjugated 8π- electron system but it is not an aromatic compound.

Reason (R) : (4n+2) π -electrons rule does not hold good and ring is not planar.

A. Both A and R are correct and R is the correct explanation of A.

B. Both A and R are correct and R is not the correct explanation of A.

C. Both A and R are not correct.

D. A is not correct but R is correct.

Answer: A

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2. Assertion (A) : Toluene on Friedal Crafts methylation gives o-and p-xylene.

Reason (R) : CH_3 group bonded to benzene ring increases electron density at o-and p-position.

A. Both A and R are correct and R is the correct explanation of A.

B. Both A and R are correct and R is not the correct explanation of A.

C. Both A and R are not correct.

D. A is not correct but R is correct.

Answer: A

View Text Solution

3. Assertion (A) : Nitration of benzene with nitric acid requires the use of concentrated sulphuric acid.

Reason (R) : The mixture of concentrated sulphuric acid and concentrated nitric acid produces the electrophilic NO_2^+.

A. Both A and R are correct and R is the correct explanation of A.

B. Both A and R are correct and R is not the correct explanation of A.

C. Both A and R are not correct.

D. A is not correct but R is correct.

Answer: A

View Text Solution

4. Assertion (A) : Among isomeric pentanes, 2,2-dimethyl-pentane has highest boiling point.

Reason (R) : Branching does not affect the boiling point.

A. Both A and R are correct and R is the correct explanation of A.

B. Both A and R are correct and R is not the correct explanation of A.

C. Both A and R are not correct.

D. A is not correct but R is correct.

Answer: C

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Section D Ncert Exemplar Solution Long Answer Type

1. An alkyl halide $C_5H_{11}Br$ (A) reacts with ethanolic KOH to give an alkene 'B', which reacts with Br_2 to give a compound 'C', which on dehydro-bromination gives an alkyne 'D'. On treatment with sodium metal inliquid ammonia one mole of 'D' gives one mole of the sodium salt of 'D' and half a mole of hydrogen gas. COmplete hydrogenation of 'D' yields a straight chain alkane. Identify A, B, C and D. Give the reactions involved.

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2. 896 mL vapour of a hydrocarbon 'A' having carbon 87.80% and hydrogen 12.19% weighs 3.28 gat STP. Hydrogenation of 'A' gives 2-methyl pentane. Also 'A' on hydration in the presence of H_2SO_4 and $HgSO_4$ gives a ketone 'B' moelcular formula $C_6H_{12}O$. The ketone 'B' gives a positive iodoformtest. Find the structure of 'A' and give the reactions involved.

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3. An unsaturated hydrocarbon 'A' adds two molecules of H_2 and on reductive ozonolysis gives butane-1, 4-dial, ethanal and propanone. Give the structure of 'A', write its IUPAC name and explain actions involved.

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4. In the presence of peroxide addition of HBr to propene takes place according to Anti-Markovnikov's rule but peroxide effect is not seen in the case of HCl and HI. Explain.

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Questions For Module Section A

1. Give structure and IUPAc name of any one isomer of compound possessing only hydrogen with molecular formula C_5H_{12}.

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2. Give chemical reaction to convert bromoethane into alkane having double carbon atoms.

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3. Give IUPAC name and product structure obtained from the reaction of but -1-ene with HBr in presence of peroxide.

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4. 

Give IUPAC name of 'X' in above reaction.

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5. Give classification of given groups into O/P and m-directing groups : $-CHO$, $-C_2H_5$, $-SO_3H$ and $-NH_2$.

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6. Give total number of σ and π-bonds present in acetophenone.

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Questions For Module Section B

1. Explain chemical reaction of ozonolysis of propene.

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2. Give reaction for the preparation of benzene from benzoic acid and phenol.

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Questions For Module Section C

1. Explain , among benzene, m-dinitrobenzene and toluene whose nitration is easier ?

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2. "Benzene posses double bond though it is stable". Explain.

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Questions For Module Section D

1. Give the reaction for the preparation of following from propene.

(i) 2,2-dibromopropane (ii) Propanone

(iii) Propane and (iv) Propen-2-ol

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