CHEMISTRY

BOOKS - BRILLIANT PUBLICATION

HYDROCARBONS

Level I

1. The compound which contains all the four $1^{\circ}, 2^{\circ}, 3^{\circ}, 4^{\circ}$ carbon atoms is

A. 2,3-Dimethylpentane

B. 2,2,4-trimethylpentane

C. 2,3,4-Trimethylpentane

D. 3,3-Dimethylpentane

Answer: B

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2. Indicate the expected structure of the organic product when ethyl magnesium bromide is treated with heavy water (D_2O).

A. $C_2H_5 - C_2H_5$

B. C_2H_5OD

C. C_2H_6

D. C_2H_5D

Answer: D

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3. On mixing a certain alkane with chlorine, and irradiating it with ultraviolet light, it forms only one monochloroalkane. This alkane could be

A. Neopentane

B. Propane

C. Pentane

D. Isopentane

Answer: A

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4. Which of the following product is obtained at cathode during Kolbe's electrolysis of $RCOO^{-}Na^{+}$ (aq.)?

A. Alkane

B. Sodium

C. Hydrogen

D. Sodium hydroxide

Answer: C

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5. Ozonolysis of 2, 3-dimethyl-1-butene followed by reduction with zinc and water gives.

A. Methanoic acid and 3-methyl-2-butanone

B. Methanal and 3-methyl-2-butanone

C. Methanal and 2-methyl-3-butanone

D. None of these

Answer: B

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6. Position of double bond in alkenes is identified by

A. Bromine water

B. Ammoniacal silver nitrate solution

C. Ozonolysis

D. Baeyer's reagent

Answer: C

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7. Which of the following can be used for the preparation of propane?

$$CH_3CH=CH_2 \xrightarrow[(ii)\,H_2O_2/NaOH]{(i)\,B_2H_6}, \quad CH_3CH_2CH_2Cl \xrightarrow[(ii)\,H_2O]{(i)\,\mathrm{Mg/ether}}, \quad CH_3CH_2CH_2I \xrightarrow[150^\circ C]{\mathrm{HI./Heat}}, CH_3CH_2CH_2COONa \xrightarrow[\mathrm{Heat}]{NaOH\,(CaO)}$$

A. $CH_3CH = CH_2 \xrightarrow[(ii)\, H_2O_2 / NaOH]{(i)\, B_2H_6}$

B. $CH_3CH_2CH_2Cl \xrightarrow[(ii)\, H_2O]{(i)\, \text{Mg/ether}}$

C. $CH_3CH_2CH_2I \xrightarrow[150^\circ C]{\text{HI./Heat}}$

D. $CH_3CH_2CH_2COONa \xrightarrow[\text{Heat}]{NaOH\,(CaO)}$

Answer: D

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8. The product obtained on heating n-heptane with Cr_2O_3. Al_2O_3 at $600^\circ C$ is

A. cyclohexane

B. cyclohexene

C. benzene

D. toluene

Answer: D

Watch Video Solution

9. Wurtz reaction converts alkyl halide into alkane when it is made to react with

A. Na in alcohol

B. Na in dry ether

C. Zn in alcohol

D. Zn in dry ether

Answer: B

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10. Which one of the following is expected to have minimum boiling point?

A. n-Butane

B. n-Pentane

C. 2-Methylbutane

D. 2,2-Dimethylpropane

Answer: D

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11. The relative stability of the three isomers of pentane, namely, n-pentane, isopentane and neopentane follows the order

A. n-pentane $>$ isopentane $>$ neopentane

B. n-pentane $>$ neopentane $>$ isopentane

C. neopentane $>$ isopentane $>$ n-pentane

D. neopentane $>$ n-pentane $>$ isopentane

Answer: C

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12. A single substitution of H atom in an alkane of molar mass $72\ \mathrm{g\ mol^{-1}}$ by chlorine produces only one product. The alkane is

A. n-pentane

B. 2-methylbutane

C. 2,2-dimethylpropane

D. n-butane

Answer: C

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13. Chlorination of n-butane produces

A. 1-chlorobutane as the chief product

B. 2-chlorobutane as the chief product

C. 1-chlorobutane more than 2-chlorobutane

D. 2-chlorobutane more than 1-chlorobutane

Answer: D

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14. Which of the following molecules has the minimum bond energy of the indicated C-H bond?

A. $CH_3 - H$

B. $CH_3CH_2 - H$

C. $(CH_3)_2CH - H$

D. $(CH_3)_3C - H$

Answer: D

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15. Which of the following conformations of cyclohexane is most stable?

A. Chair

B. Boat

C. Twist-boat

D. Half-chair

Answer: A

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

A. propane

B. propene

C. propyne

D. propanol

Answer: B

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17. The dehydration of 2 methylbutanol with concentrated H_2SO_4 produces .

A. 2-methylbutene as the major product

B. 2-methylbut-2-ene as the major product

C. 1-pentene

D. pent-2-ene

Answer: B

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18. The addition of HCl in the presence of peroxide does not follow anti-Markovnikov's rule because

A. HCl bond is too strong to be broken homolytically

B. Cl atom is not reactive enough to add on to a double bond

C. Cl combines with H to give back HCl

D. HCl is a reducing agent

Answer: A

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19. When ethene reacts with bromine in aqueous sodium chloride solution, the product(s) obtained is (are)

A. ethylene dibromide only

B. ethylene dibromide and 1-bromo-2-chloroethane

C. 1-bromo-2-chloroethane only

D. ethylene dichloride only

Answer: B

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20. The treatment of $CH_3\underset{\underset{CH_3}{|}}{C}=CH_2$ with $NaIO_4$ or boiling $KMnO_4$ produces

A. $CH_3COCH_3 + CH_2O$

B. $CH_3CHO + CH_3CHO$

C. $CH_3COCH_3 + CO_2$

D. $CH_3COCH_3 + HCOOH$

Answer: C

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21. An alkene on oxidative ozonolysis gives adipic acid. The alkene is:

A. cyclohexene

B. 1-methylcyclopentene

C. 1,2-dimethylcyclobutene

D. 3-hexene

Answer: A

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22. Which of the following hydrocarbons has the lowest dipole moment?

A. 

B. $CH_3C = CCH_3$

C. $CH_3CH_2C \equiv CH$

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

Answer: B

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23. Identify a reagent from the following list which can easily distinguish between 1-butyne and 2-butyne.

A. bromine, CCl_4

B. H_2 , Lindlar catalyst

C. dilute H_2SO_4, $HgSO_4$

D. ammoniacal Cu_2Cl_2 solution

Answer: D

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24. The addition of water to propyne in the presence of $HgSO_4 - H_2SO_4$ produces

A. $CH_3CH = CHOH$

B. CH_3COCH_3

C. $CH_3CH_2CH_2OH$

D. CH_3CHO

Answer: B

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25. The reduction of an alkyne to alkene using Lindlar catalyst results into

A. cis addition of hydrogen atoms

B. trans addition of hydrogen atorns

C. a mixture obtained by cis and trans additions of hydrogen in equimolar amounts.

D. a mixture obtained by cis and trans additions of hydrogen atoms in unequal amounts

Answer: A

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26. The treatment of $CH_3CH_2C \equiv CCH_2CH_2CH_3$ with $KMnO_4$ under neutral conditions at room temperature gives

A. $CH_3CH_2\underset{\underset{OH}{|}}{C}H-\underset{\underset{OH}{|}}{C}H-CH_2CH_2CH_3$

B. $C\dot{H}_3CH_2\underset{\underset{OH}{|}}{C}H-\underset{\underset{O}{||}}{C}-CH_2CH_2CH_3$

C. $CH_3CH_2-\underset{\underset{O}{||}}{C}--\underset{\underset{O}{||}}{C}-CH_2CH_2CH_3$

D. $CH_3CH_2COOH+CH_3CH_2CH_2COOH$

Answer: C

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27. Which statement is correct?

A. Low chemical reactivity of alkanes is due to strong C-Cand C-H bonds.

B. Alkanes show characteristic substitution reactions because they are saturated

C. Reaction of alkanes with fluorine is explosive even in dark

D. All of the above

Answer: D

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28. Which of the following species is aromatic?

A. cyclopropenyl cation

B. cyclobutadiene

C. cyclopentadiene

D. cyclopropane

Answer: A

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29. The reaction of toluene with chlorine in presence of ferric chloride gives predominantly

A. benzoyl chloride

B. m-chlorotoluene

C. benzyl chloride

D. o-and p-chlorotoluene

Answer: D

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30. The correct sequence of activating power of a group in benzene is

A. $-NH_2 > -NHCOCH_3 > -CH_3$

B. $-NH_2 < -NHCOCH_3 < -CH_3$

C. $-NH_2 > -NHCOCH_3 < -CH_3$

D. $-NH_2 < -NHCOCH_3 > -CH_3$

Answer: A

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31. When alcoholic solution of ethylene dibromide is heated with granulated zinc, the compound formed is:

A. ethane

B. ethylene

C. butane

D. isobutane

Answer: B

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32. Which of the following yields both alkane and alkene?

A. Williamson's synthesis

B. Kolbe's electrolytic method

C. Wittig reaction

D. Sandmeyer's reaction

Answer: B

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33. Out of the five isomeric hexanes, the isomer that can give two monochlorinated compounds is

A. 2,3-Dimethyl butane

B. 2,2-Dimethyl butane

C. 2,2-Dimethyl pentane

D. n-Hexane

Answer: A

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34. The structure of alkane with molecular formula C_8H_{18} that has only $1^\circ H$ atoms is:

A. 2,2,3,3-Tetramethylbutane

B. 2,2,3-Trimethylpentane

C. 2,2,4-Trimethylpentane

D. 2,3,3-Trimethylpentane

Answer: A

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35. Which of the following will have lower pK_a value?

A. H

B. H_b

C. H_c

D. H_d

Answer: A

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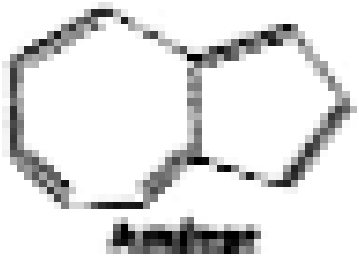
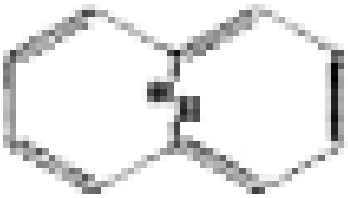
36. Which of the following is non-aromatic in nature?

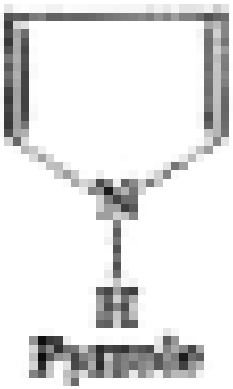


A.



B.

C.



D.

Answer: B

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37. Which statement is correct about cyclopentadienyl anion (I) and benzene (II)?

A. Both (I) and (II) are aromatic but (II) is more stable than (I)

B. Both (I) and (II) are aromatic and have the same stability

C. (II) is more aromatic and more stable than (I) and it is non-aromatic

D. (I) is more stable than (II) though both are aromatic.

Answer: A

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38. 

Which reagent cannot be used for the above conversion?

A. 

B. Et_3N

C. $POCl_3$

D. NH_3

Answer: C

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39. The compound 1, 2-butadiene has:

A. only sp-hybridised carbon atoms

B. only sp^2-hybridised carbon atoms

C. both sp-and sp^2-hybridised carbon atoms

D. sp-, sp^2- and sp^3- hybridised carbon atoms

Answer: D

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40. Which one of the following alkenes will react fastest with H_2 under catalytic hydrogenation condition?

A. 

B. 

C. 

D. 

Answer: A

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41. 2-Hexyne gives trans-2-hexene on treatment with:

A. Li / NH_3

B. $Pd / BaSO_4$

C. $LiAlH_4$

D. Pt / H_2

Answer: A

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42. Oxidation of naphthalene by acidic $KMnO_4$ gives:

A. toluene

B. benzaldehyde

C. phthalic acid

D. benzoic acid

Answer: C

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43. Which of the following has maximum resonance energy?

A. Anthracene

B. Benzene

C. Naphthalene

D. Phenanthrene

Answer: D

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44. The synthesis of 3-octyne is achieved by adding a bromoalkane into a mixture of sodium amide and alkyne. The bromoalkane and

alkyne, respectively, are

A. $BrCH_2CH_2CH_2CH_2CH_3$ and $CH_3CH_2C \equiv CH$

B. $BrCH_2CH_2CH_3$ and $CH_3CH_2CH_2C \equiv CH$

C. $BrCH_2CH_2CH_2CH_2CH_3$ and $CH_3C \equiv CH$

D. $BrCH_2CH_2CH_2CH_3$ and $CH_3CH_2C \equiv CH$

Answer: B

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45. On passing benzene vapour through a red hot tube at $700 - 800^\circ C$ or through molten lead we get:

A. diphenyl

B. phenol

C. toluene

D. benzaldehyde

Answer: A

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46. The compound which contains all the four $1^\circ, 2^\circ, 3^\circ, 4^\circ$ carbon atoms is

A. 2,3-Dimethylpentane

B. 2,2,4-trimethylpentane

C. 2,3,4-Trimethylpentane

D. 3,3-Dimethylpentane

Answer: B

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47. Indicate the expected structure of the organic product when ethyl magnesium bromide is treated with heavy water (D_2O).

A. $C_2H_5 - C_2H_5$

B. C_2H_5OD

C. C_2H_6

D. C_2H_5D

Answer: D

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48. On mixing a certain alkane with chlorine, and irradiating it with ultraviolet light, it forms only one monochloroalkane. This alkane could be

A. Neopentane

B. Propane

C. Pentane

D. Isopentane

Answer: A

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49. Which of the following product is obtained at cathode during Kolbe's electrolysis of $RCOO^{-}Na^{+}$ (aq.)?

A. Alkane

B. Sodium

C. Hydrogen

D. Sodium hydroxide

Answer: C

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50. Ozonolysis of 2, 3-dimethyl-1-butene followed by reduction with zinc and water gives.

A. Methanoic acid and 3-methyl-2-butanone

B. Methanal and 3-methyl-2-butanone

C. Methanal and 2-methyl-3-butanone

D. None of these

Answer: B

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51. Position of double bond in alkenes is identified by

A. Bromine water

B. Ammoniacal silver nitrate solution

C. Ozonolysis

D. Baeyer's reagent

Answer: C

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52. Which of the following can be used for the preparation of propane? $CH_3CH=CH_2 \xrightarrow[(ii)\,H_2O_2/NaOH]{(i)\,B_2H_6}$, $CH_3CH_2CH_2Cl \xrightarrow[(ii)\,H_2O]{(i)\,\text{Mg/ether}}$, $CH_3CH_2CH_2I \xrightarrow[150^\circ C]{\text{HI./Heat}}$, $CH_3CH_2CH_2COONa \xrightarrow[\text{Heat}]{NaOH\,(CaO)}$

A. $CH_3CH=CH_2 \xrightarrow[(ii)\,H_2O_2/NaOH]{(i)\,B_2H_6}$

B. $CH_3CH_2CH_2Cl \xrightarrow[(ii)\,H_2O]{(i)\,Mg/\text{ether}}$

C. $CH_3CH_2CH_2I \xrightarrow[150^\circ C]{HI/\text{Heat}}$

D. $CH_3CH_2CH_2COONa \xrightarrow[\text{Heat}]{NaOH\,(CaO)}$

Answer: D

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53. The product obtained on heating n-heptane with Cr_2O_3. Al_2O_3 at $600^\circ C$ is

A. cyclohexane

B. cyclohexene

C. benzene

D. toluene

Answer: D

Watch Video Solution

54. Wurtz reaction converts alkyl halide into alkane when it is made to react with

A. Na in alcohol

B. Na in dry ether

C. Zn in alcohol

D. Zn in dry ether

Answer: B

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55. Which one of the following is expected to have minimum boiling point?

A. n-Butane

B. n-Pentane

C. 2-Methylbutane

D. 2,2-Dimethylpropane

Answer: D

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56. The relative stability of the three isomers of pentane, namely, n-pentane, isopentane and neopentane follows the order

A. n-pentane $>$ isopentane $>$ neopentane

B. n-pentane $>$ neopentane $>$ isopentane

C. neopentane $>$ isopentane $>$ n-pentane

D. neopentane $>$ n-pentane $>$ isopentane

Answer: C

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57. A single substitution of H atom in an alkane of molar mass $72\ \mathrm{g\ mol^{-1}}$ by chlorine produces only one product. The alkane is

A. n-pentane

B. 2-methylbutane

C. 2,2-dimethylpropane

D. n-butane

Answer: C

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58. Chlorination of n-butane produces

A. 1-chlorobutane as the chief product

B. 2-chlorobutane as the chief product

C. 1-chlorobutane more than 2-chlorobutane

D. 2-chlorobutane more than 1-chlorobutane

Answer: D

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59. Which of the following molecules has the minimum bond energy of the indicated C-H bond?

A. $CH_3 - H$

B. $CH_3CH_2 - H$

C. $(CH_3)_2CH - H$

D. $(CH_3)_3C - H$

Answer: D

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60. Which of the following conformations of cyclohexane is most stable?

A. Chair

B. Boat

C. Twist-boat

D. Half-chair

Answer: A

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

A. propane

B. propene

C. propyne

D. propanol

Answer: B

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62. The dehydration of 2 methylbutanol with concentrated H_2SO_4 produces .

A. 2-methylbutene as the major product

B. 2-methylbut-2-ene as the major product

C. 1-pentene

D. pent-2-ene

Answer: B

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63. The addition of HCl in the presence of peroxide does not follow anti-Markovnikov's rule because

A. HCl bond is too strong to be broken homolytically

B. Cl atom is not reactive enough to add on to a double bond

C. Cl combines with H to give back HCI

D. HCl is a reducing agent

Answer: A

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64. When ethene reacts with bromine in aqueous sodium chloride solution, the product(s) obtained is (are)

A. ethylene dibromide only

B. ethylene dibromide and 1-bromo-2-chloroethane

C. 1-bromo-2-chloroethane only

D. ethylene dichloride only

Answer: B

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65. The treatment of $CH_3\underset{\underset{CH_3}{|}}{C}=CH_2$ with $NaIO_4$ or boiling $KMnO_4$ produces

A. $CH_3COCH_3 + CH_2O$

B. $CH_3CHO + CH_3CHO$

C. $CH_3COCH_3 + CO_2$

D. $CH_3COCH_3 + HCOOH$

Answer: C

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66. An alkene on oxidative ozonolysis gives adipic acid. The alkene is:

A. cyclohexene

B. 1-methylcyclopentene

C. 1,2-dimethylcyclobutene

D. 3-hexene

Answer: A

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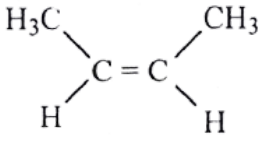
67. Which of the following hydrocarbons has the lowest dipole moment?

A. 

B. $CH_3C \equiv CCH_3$

C. $CH_3CH_2C \equiv CH$

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

Answer: B

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68. Identify a reagent from the following list which can easily distinguish between 1-butyne and 2-butyne.

A. bromine, CCl_4

B. H_2 Lindlar catalyst

C. dilute H_2SO_4, $HgSO_4$

D. ammoniacal Cu_2Cl_2 solution

Answer: D

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69. The addition of water to propyne in the presence of $HgSO_4 - H_2SO_4$ produces

A. $CH_3CH = CHOH$

B. CH_3COCH_3

C. $CH_3CH_2CH_2OH$

D. CH_3CHO

Answer: B

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70. The reduction of an alkyne to alkene using Lindlar catalyst results into

A. cis addition of hydrogen atoms

B. trans addition of hydrogen atoms

C. a mixture obtained by cis and trans additions of hydrogen in equimolar amounts.

D. a mixture obtained by cis and trans additions of hydrogen atoms in unequal amounts.

Answer: A

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71. The treatment of $CH_3CH_2C \equiv CCH_2CH_2CH_3$ with $KMnO_4$ under neutral conditions at room temperature gives

A. $CH_3CH_2\underset{\underset{OH}{|}}{C}H - \underset{\underset{OH}{|}}{C}HCH_2CH_2CH_3$

B. $CH_3CH_2\underset{\underset{OH}{|}}{C}H - \underset{\underset{O}{||}}{C} - CH_2CH_2CH_3$

C. $CH_3CH_2\underset{\underset{O}{||}}{C} - \underset{\underset{O}{||}}{C} - CH_2CH_2CH_3$

D. $CH_3CH_2COOH + CH_3CH_2CH_2COOH$

Answer: C

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72. Which statement is correct?

A. Low chemical reactivity of alkanes is due to strong C-C and C-H bonds.

B. Alkanes show characteristic substitution reactions because they are saturated

C. Reaction of alkanes with fluorine is explosive even in dark

D. All of the above

Answer:

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73. Which of the following species is aromatic?

A. cyclopropenyl cation

B. cyclobutadiene

C. cyclopentadiene

D. cyclopropane

Answer: A

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74. The reaction of toluene with chlorine in presence of ferric chloride gives predominantly

A. benzoyl chloride

B. m-chlorotoluene

C. benzyl chloride

D. o-and p-chlorotoluene

Answer: D

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75. The correct sequence of activating power of a group in benzene is

A. $-NH_2 > -NHCOCH_3 > -CH_3$

B. $-NH_2 < -NHCOCH_3 < -CH_3$

C. $-NH_2 > -NHCOCH_3 < -CH_3$

D. $-NH_2 < -NHCOCH_3 > -CH_3$

Answer: A

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76. When alcoholic solution of ethylene dibromide is heated with granulated zinc, the compound formed is:

A. ethane

B. ethylene

C. butane

D. isobutane

Answer: B

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77. Which of the following yields both alkane and alkene?

A. Williamson's synthesis

B. Kolbe's electrolytic method

C. Wittig reaction

D. Sandmeyer's reaction

Answer: B

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78. Out of the five isomeric hexanes, the isomer that can give two monochlorinated compounds is

A. 2,3-Dimethyl butane

B. 2,2-Dimethyl butane

C. 2,2-Dimethyl pentane

D. n-Hexane

Answer: A

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79. The structure of alkane with molecular formula C_8H_{18} that has only $1^\circ H$ atoms is:

A. 2, 2, 3, 3 -Tetramethylbutane

B. 2, 2, 3-Trimethylpentane

C. 2, 2, 4-Trimethylpentane

D. 2, 3, 3-Trimethylpentane

Answer: A

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80. Which of the following will have lower pK_a value?

A. H_a

B. H_b

C. H_c

D. H_d

Answer: A

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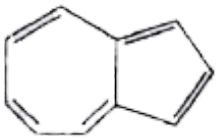
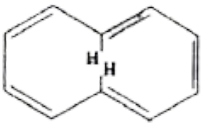
81. Which of the following is non-aromatic in nature?

A.



Azulene

B.

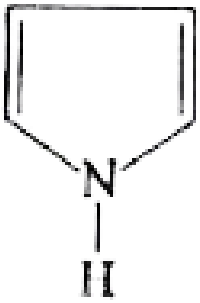


[10]-Annulene

C.

Furan

D.



Pyrrole

Answer: B

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82. Which statement is correct about cyclopentadienyl anion (I) and benzene (II)?

A. Both (I) and (II) are aromatic but (II) is more stable than (I)

B. Both (I) and (II) are aromatic and have the same stability

C. (II) is more aromatic and more stable than (I) and it is non-aromatic

D. (I) is more stable than (II) though both are aromatic.

Answer: A

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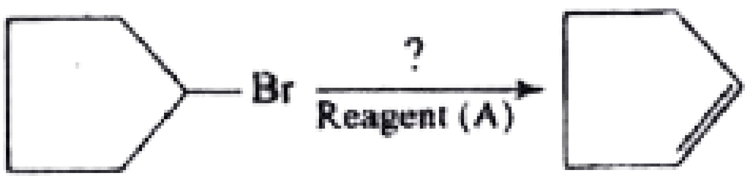
83. 

(A) (B)

. Which reagent cannot be used for the above conversion?

A. 

B. Et_3N

C. $POCl_3$

D. NH_3

Answer: C

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84. The compound 1, 2-butadiene has:

A. only sp-hybridised carbon atoms

B. only sp^2-hybridised carbon atoms

C. both sp-and sp^2-hybridised carbon atoms

D. $sp-$, sp^2- and sp^3- hybridised carbon atoms

Answer: D

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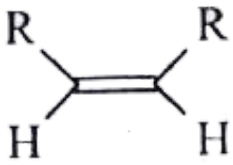
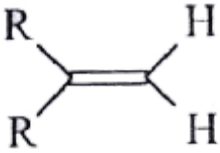
85. Which one of the following alkenes will react fastest with H_2 under catalytic hydrogenation condition?

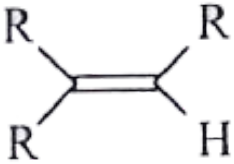
A.



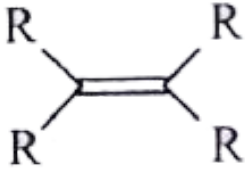
B.



C.



D.



Answer: A

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86. 2-Hexyne gives trans-2-hexene on treatment with:

A. Li / NH_3

B. $Pd / BasO_4$

C. $LiAlH_4$

D. Pt / H_2

Answer: A

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87. Oxidation of naphthalene by acidic $KMnO_4$ gives:

A. toluene

B. benzaldehyde

C. phthalic acid

D. benzoic acid

Answer: C

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88. Which of the following has maximum resonance energy?

A. Anthracene

B. Benzene

C. Naphthalene

D. Phenanthrene

Answer: D

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89. The synthesis of 3-octyne is achieved by adding a bromoalkane into a mixture of sodium amide and alkyne. The bromoalkane and

alkyne, respectively, are

A. $BrCH_2CH_2CH_2CH_2CH_3$ and $CH_3CH_2C \equiv CH$

B. $BrCH_2CH_2CH_3$ and $CH_3CH_2CH_2C \equiv CH$

C. $BrCH_2CH_2CH_2CH_2CH_3$ and $CH_3C \equiv CH$

D. $BrCH_2CH_2CH_2CH_3$ and $CH_3CH_2C \equiv CH$

Answer: B

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90. On passing benzene vapour through a red hot tube at $700 - 800^\circ C$ or through molten lead we get:

A. diphenyl

B. phenol

C. toluene

D. benzaldehyde

Answer: A

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Level Ii

1. In reaction , $CH_2 = CH_2 \xrightarrow{\text{Hypochlorous acid}} A \xrightarrow{B} \begin{matrix} CH_2OH \\ | \\ CH_2OH \end{matrix}$, then A and B are :

A. CH_3CH_2Cl and NaOH

B. $CH_3 - CH_3$ and KOH

C. CH_3CH_2OH and HCl

D. $CH_2OH - CH_2Cl$ and aq. $NaHCO_3$

Answer: D

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2. Which of the following is the predominate product in the reaction of HOBr with propene?

A. 2-bromopropan-1-ol

B. 3-bromopropan-1-ol

C. 2-bromopropan-2-ol

D. 1-bromopropan-2-ol

Answer: D

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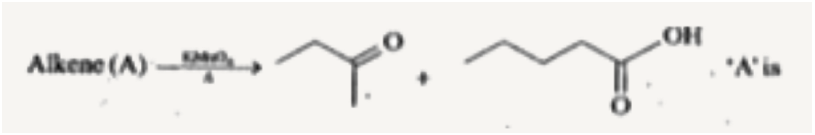
3. 

A.

B.

C.

D.

Answer: A

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4. $CH_3-CH=CH_2+NOCl\rightarrow P$. Identify the adduct.

A. $CH_3-\underset{Cl}{\underset{|}{CH}}-\underset{NO}{\underset{|}{CH_2}}$

B. $CH_3-\underset{NO}{\underset{|}{CH}}-\underset{Cl}{\underset{|}{CH_2}}$

C. $CH_3-CH_2-\overset{NO}{\overset{|}{\underset{Cl}{\underset{|}{CH}}}}$

D. $\underset{NO}{\underset{|}{CH_2}}-CH_2-\underset{Cl}{\underset{|}{CH_2}}$

Answer: B

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5. Which among the following is aromatic?

A. 

B. 

C. 

D. 

Answer: D

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6. In the following sequence of reactions: Toluene $\xrightarrow{KMnO_4} A \xrightarrow{SOCl_2} B \xrightarrow[BaSO_4]{H_2/Pd} C$, the product C is

A. $C_6H_5CH_3$

B. $C_6H_5CH_2OH$

C. C_6H_5CHO

D. C_6H_5COOH

Answer: C

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7. Addition of HBr on $CH \equiv C - CH_2 - CH = CH_2$ and $CH \equiv C - CH = CH_2$ separately gives :

A. $CH \equiv C - CH_2 - CHBr - CH_3$ and

$$CH_2 = \underset{\underset{Br}{|}}{C} - CH = CH_2$$

B. $CH_2 = \underset{\underset{Br}{|}}{C} - CH_2 - CHBr - CH_2$ and

$$CH_2 = \underset{\underset{Br}{|}}{C} - CH = CH_2$$

C. $CH \equiv C - CH_2 - \underset{\underset{Br}{|}}{CH} - CH_3$ and $CH \equiv C - \underset{\underset{Br}{|}}{CH} - CH_3$

D. None of these

Answer: A

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8. The hydrocarbon which decolourises alkaline $KMnO_4$ solution, but does not give any precipitate with ammoniacal silver nitrate is:

A. methane

B. acetlyene

C. ethane

D. ethylene

Answer: D

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9. In the complete combustion of C_nH_{2n+2} , the number of oxygen moles required is:

A. $\left(\frac{n}{2}\right)O_2$

B. $\left(\frac{n+1}{2}\right)O_2$

C. $\left(\frac{3n+1}{2}\right)O_2$

D. $\left(\frac{n+2}{2}\right)O_2$

Answer: C

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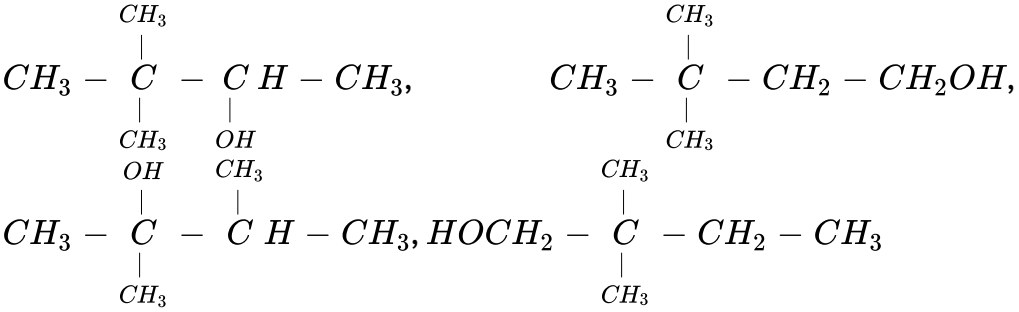
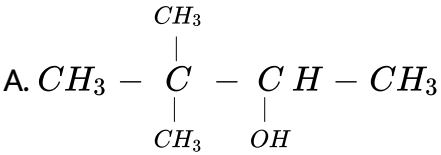
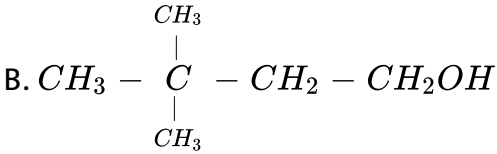
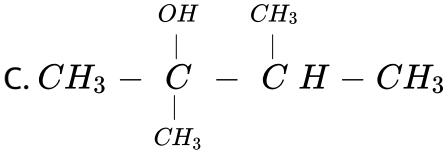
10. The product of following reaction is

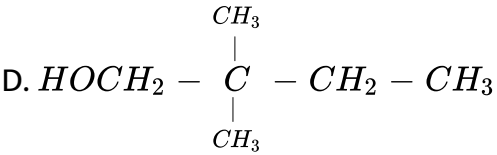
$$CH_3-\underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}}-CH=CH_2 \xrightarrow[(ii)\,NaBH_4+NaOH]{(i)\,Hg(CH_3COO)_2,THF} :$$



A. 

B. 

C. 

D. 

Answer: A

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11. The compound X(C_5H_8) reacts with ammoniacal $AgNO_3$ to give a white precipitate and reacts with excess of $KMnO_4$ to give the acid,

$(CH_3)_2CH - COOH$. Therefore, X is:

A. $CH_2 = CH - CH = CH - CH_3$

B. $CH_3(CH_2)_2C \equiv CH$

C. $(CH_3)_2CHC \equiv CH$

D. $(CH_3)_2C = C = CH_2$

Answer: C

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12. What volume of CH_4 at NTP is formed when 20.5.g of CH_3COONa is treated with sodalime?

A. 4.4 litre

B. 2.2 litre

C. 3.2 litre

D. 5.6 litre

Answer: D

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13. Propene, $CH_3 - CH = CH_2$ can be converted into 1-propanol by oxidation. Which set of reagents among the following is ideal to effect the conversion?

A. Alkaline $KMnO_4$

B. B_2H_6 and alk. H_2O_2

C. O_3/ zinc dust

D. $OsO_4 / CHCl_3$

Answer: B

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14. Identify 'X' in the reaction :

$$Br - CH_2 - \underset{CH_2Br}{\overset{CH_2Br}{\underset{|}{\overset{|}{C}}}} - CH_2Br \xrightarrow{Zn/\Delta} X, \text{X is}$$

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

B. 

C. 

D. $CH_3C \equiv C - CH = CH_2$

Answer: B

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15. An alkene, obtained by the dehydration of an alcohol, on ozonolysis gives acetaldehyde only as the product. The alcohol is:

A. $CH_3CH_2CH_2OH$

B. CH_3CH_2OH

C. $CH_3CH = CHCH_2OH$

D. $CH_3CH_2\underset{\underset{OH}{|}}{C}HCH_3$

Answer: D

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16. Which compound on reductive ozonolysis forms only glyoxal?

A. Ethyne

B. Ethene

C. Ethane

D. 1,3-butadiene

Answer: A

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17. 10 ml of a certain hydrocarbon require 55 mL of oxygen for complete combustion and the volume of CO_2 produced is 40 mL. What is the formula of hydrocarbon?

A. C_4H_6

B. C_2H_4

C. CH_4

D. C_2H_6

Answer: A

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18. During ozonolysis of $CH_2 = CH_2$ if hydrolysis is made in absence of Zn dust the products formed are:

A. HCHO

B. HCOOH

C. CH_3OH

D. CH_2OHCH_2OH

Answer: B

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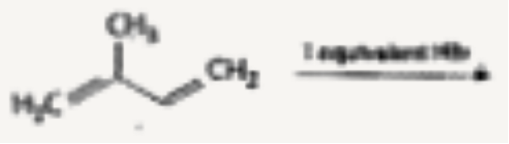
19. In the following reaction , the major product is



A. 

B. 

C. 

D. 

Answer: D

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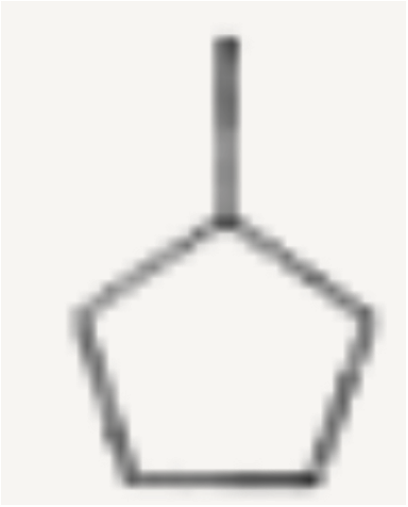
20. 

$\xrightarrow{Br_2/hv} X \xrightarrow{\text{Alc. KOH}} Y \xrightarrow{\text{HBr/Peroxide}} Z$. The compound Z is

A. 

B. 

C. 

D. 

Answer: C

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21. The compound (i) decolourises $KMnO_4$ (ii) forms ozonide with ozone and (iii) undergoes polymerization. It will be :

A. C_6H_6

B. C_3H_8

C. C_2H_4

D. C_2H_6

Answer: C

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22. A hydrocarbon X adds on one mole of hydrogen to give hydrocarbon and decolourised bromine water. X reacts with $KMnO_4$ in presence of acid to give two mole of the same carboxylic acid. The structure of X is :

A. $CH_3CH = CHCH_2CH_2CH_3$

B. $CH_3CH_2CH = CHCH_2CH_3$

C. $CH_3CH_2CH_2 - CH = CHCH_3$

D. $CH_2 = CH - CH_2CH_2CH_3$

Answer: B

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23. Which of the following molecules/species are aromatic in character?

A. 

B. 

C. 

D. 

Answer: C

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24. In the reaction, $C_6H_5CH_3 \xrightarrow{\text{Oxidation}} A \xrightarrow{\text{NaOH}} B \xrightarrow[\Delta]{\text{Soda lime}} C$ the product C is :

A. C_6H_5OH

B. C_6H_6

C. C_6H_5COONa

D. C_6H_5ONa

Answer: B

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25. Benzene contains double bonds but does not give addition reactions because:

A. double bonds in benzene are strong

B. double bonds change their position rapidly

C. resonance lowers the energy of benzene molecule and leads to greater stabilisation

D. none of the above

Answer: C

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

$C_6H_5\underset{\underset{Br}{|}}{C}HCH_3, C_6H_5CH_2CH_2CH_3Br, C_6H_5\underset{\underset{Br}{|}}{C}HCH_2CH_3$

A. $C_6H_5\underset{\underset{Br}{|}}{C}HCH_3$

B. $C_6H_5CH_2CH_2CH_3Br$

C. 

D. $C_6H_5\underset{\underset{Br}{|}}{C}HCH_2CH_3$

Answer: D

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27. Which product is formed when the following compound is treated with Br_2 in the presence of $FeBr_3$?

A. 

B. 

C. 

D. 

Answer: C

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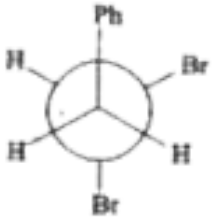
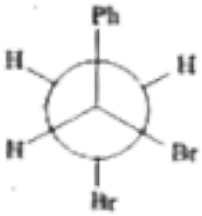
28. The most stable conformation of the products of following reaction is :

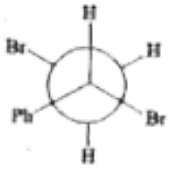
A. 

B. 

C.



D.



Answer: C

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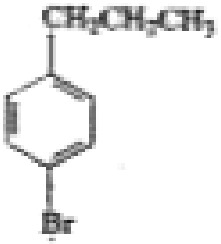
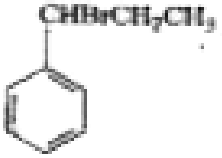
29. Provide the structure of the major products from the following

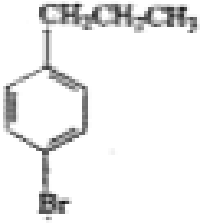
reaction


CH2CH2CH2Br
,

CH2CH2CH3
Br
,

CH2CHBrCH3
,

CHBrCH2CH3

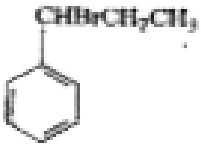
A.

CH2CH2CH2Br

B.

CH2CH2CH3
Br

C.

CH2CHBrCH3

D.

CHBrCH2CH3

Answer: D

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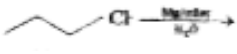
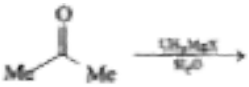
30. Which of the following reactions will not give propane ?

A. 

B. 

C. 

D. 

Answer: D

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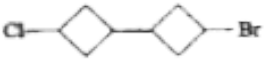
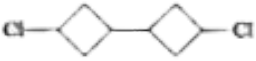
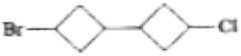
31. Identify the product formed when formaldehyde reacts with NH_3. Write the use of the compound formed.

A. 

B. 

C. 

D. 

Answer: C

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32. Out of the following compounds , I)Pent-1-ene , II)Pent-2-ene , III)2-Methyl but-1-ene , IV) 2-Methyl but-2-ene . Which pair has the lowest and the highest heats of combustion , respectively ?

A. (IV) and (I) respectively

B. (I) and (IV) respectively

C. (II) and (III) respectively

D. (III) and (II), respectively

Answer: A

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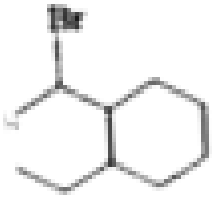
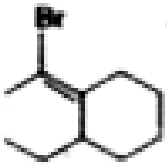
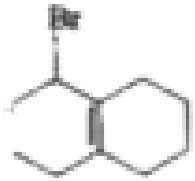
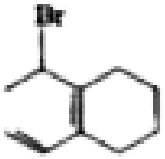
33. Which of the following will undergo faster dehydrobromination ?

A. 

B. 

C. 

D. 

Answer: D

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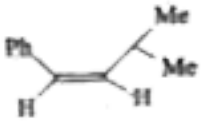
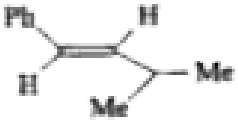
34. 

A. 

B. 



C.

D. All

Answer: C

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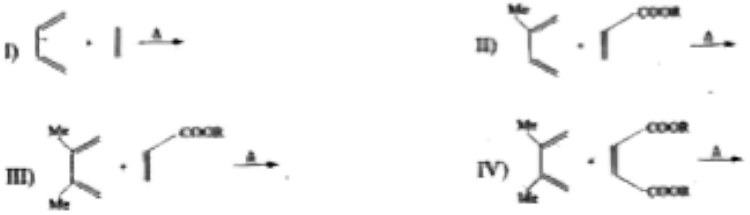
35. Give the decreasing order of reactivity of Diels-Alder reactions for the following :



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

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

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

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

Answer: B

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36. 2-Phenyl propene on acidic hydration gives :

A. 2-phenyl-2-propanol

B. 2-phenyl-1-propanol

C. 3-phenyl-1-propanol

D. 1-phenyl-2-propanol

Answer: A

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37.

The product (Y) is

A. 

B. 

C. 

D. 

Answer: B

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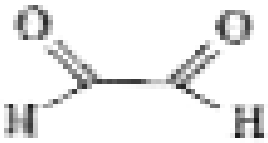
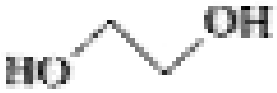
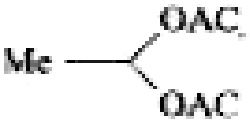
38. $H - \equiv - H \xrightarrow[(ii)\, H_2O / Zn]{(i)\, O_3} (X) \xrightarrow{Zn / CH_3COOH} (Y)$. Compound (Y) :



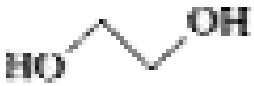


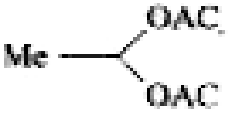
, $Me - COOH$, ,



A. 

B. Me-COOH

C. 

D. 

Answer: C

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39. What product would you expect from addition of deuterium chloride to 2-cyclohexyl-4-methyl-2-pentene ?

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40. In reaction,

$$CH_2 = CH_2 \xrightarrow{\text{Hypochlorous acid}} A \xrightarrow{B} \begin{matrix} CH_2OH \\ | \\ CH_2OH \end{matrix},$$

, then A and B are:

A. CH_3CH_2Cl and $NaOH$

B. $CH_3 - CH_3$ and KOH

C. CH_3CH_2OH and HCl

D. $CH_2OH - CH_2Cl$ and $aq.\ NaHCO_3$

Answer: D

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41. Which of the following is the predominate product in the reaction of HOBr with propene?

A. 2-bromopropan-1-ol

B. 3-bromopropan-1-ol

C. 2-bromopropan-2-ol

D. 1-bromopropan-2-ol

Answer: D

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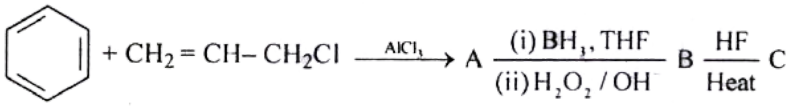
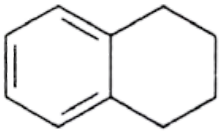
42. Identify 'C' in the following reaction:



A.



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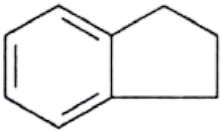
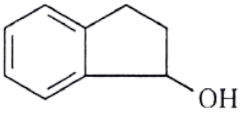
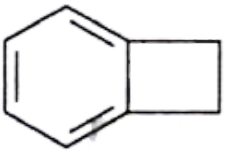


C.



D.



Answer: B

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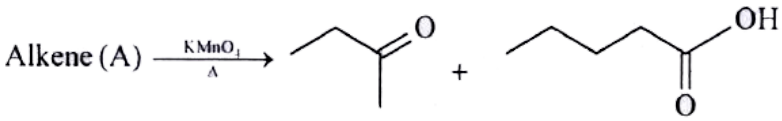
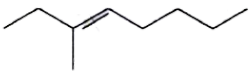
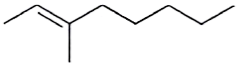
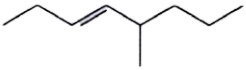
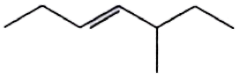
43. 

. 'A' is

A. 

B. 

C. 

D. 

Answer: A

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44. $CH_3 - CH = CH_2 + NOCl \rightarrow P$. Identify the adduct.

A. $CH_3 - \underset{\underset{Cl}{|}}{CH} - \underset{\underset{NO}{|}}{CH_2}$

B. $CH_3 - \underset{\underset{NO}{|}}{CH} - \underset{\underset{Cl}{|}}{CH_2}$

C. $CH_3 - CH_2 - \overset{\overset{NO}{|}}{\underset{\underset{Cl}{|}}{CH}}$

D. $\overset{\overset{NO}{|}}{CH_2} - CH_2 - \overset{\overset{Cl}{|}}{CH_2}$

Answer: B

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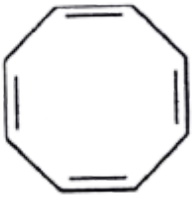
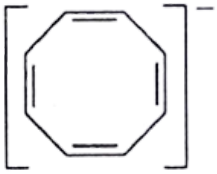
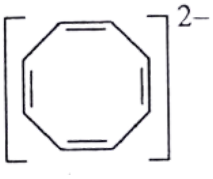
45. Which among the following is aromatic?

A. 

B. 

C. 

D. 

Answer: D

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46. In the following sequence of reactions: Toluene $\xrightarrow{KMnO_4} A \xrightarrow{SOCl_2} B \xrightarrow[BaSO_4]{H_2/Pd} C$, the product C is

A. $C_6H_5CH_3$

B. $C_6H_5CH_2OH$

C. C_6H_5CHO

D. C_6H_5COOH

Answer: C

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47. Addition of HBr on $CH \equiv C - CH_2 - CH = CH_2$ and $CH \equiv C - CH = CH_2$ separately gives :

A.

$$CH \equiv C - CH_2 - CHBr - CH_3 \text{ and } CH_2 = \underset{\underset{Br}{|}}{C} - CH = CH_2$$

B.

$$CH = \underset{\underset{Br}{|}}{C} - CH_2 - CHBr - CH_2 \text{ and } CH_2 = \underset{\underset{Br}{|}}{C} - CH = CH_2$$

C.

$$CH \equiv C - CH_2 - \underset{\underset{Br}{|}}{CH} - CH_3 \text{ and } CH_2 \equiv C - \underset{\underset{Br}{|}}{CH} = CH_3$$

D. None of these

Answer: A

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48. The hydrocarbon which decolourises alkaline $KMnO_4$ solution, but does not give any precipitate with ammoniacal silver nitrate is:

A. benzene

B. acetlyene

C. propyne

D. butyne-2

Answer: D

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49. In the complete combustion of C_nH_{2n+2} , the number of oxygen moles required is:

A. $\left(\frac{n}{2}\right)O_2$

B. $\left(\frac{n+1}{2}\right)O_2$

C. $\left(\frac{3n+1}{2}\right)O_2$

D. $\left(\frac{n+2}{2}\right)O_2$

Answer: C

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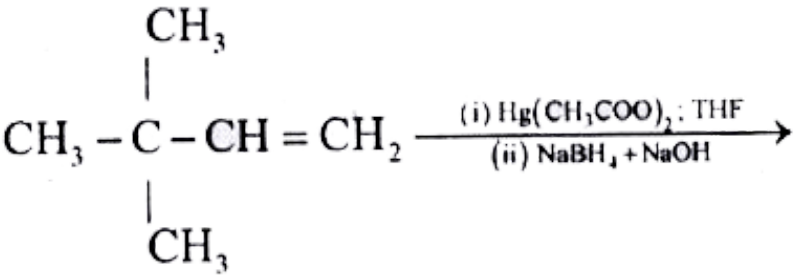
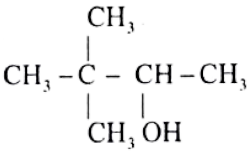
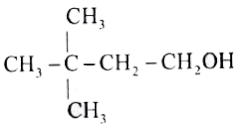
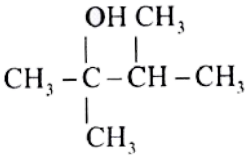
50. The product of following reaction is

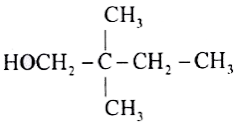


A.



B. 

C. 

D. 

Answer: A

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51. The compound X(C_5H_8) reacts with ammoniacal $AgNO_3$ to give a white precipitate and reacts with excess of $KMnO_4$ to give the acid, $(CH_3)_2CH-COOH$. Therefore, X is:

A. $CH_2=CH-CH-CH_3$

B. $CH_3(CH_2)_2C\equiv CH$

C. $(CH_3)_2CHC \equiv CH$

D. $(CH_3)_2C = C = CH_2$

Answer: C

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52. What volume of CH_4 at NTP is formed when 20.5.g of CH_3COONa is treated with sodalime?

A. 4.4 litre

B. 2.2 litre

C. 3.2 litre

D. 5.6 litre

Answer: D

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53. Propene, $CH_3 - CH = CH_2$ can be converted into 1-propanol by oxidation. Which set of reagents among the following is ideal to effect the conversion?

A. Alkaline $KMnO_4$

B. B_2H_6 and $alk.\ H_2O_2$

C. O_3 / zinc dust

D. $OsO_4 / CHCl_3$

Answer: B

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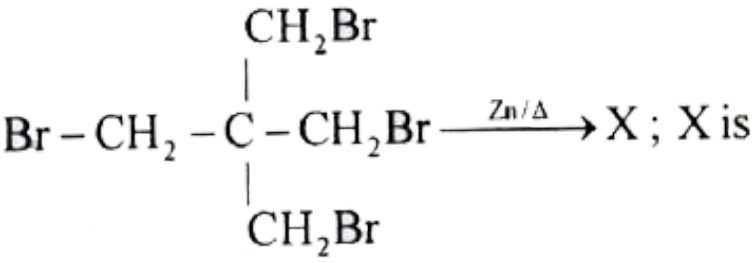
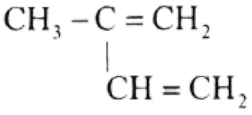
54. Identify 'X' in the reaction:



A. 

B. 

C. 

D. $CH_3C \equiv C - CH = CH_2$

Answer: B

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55. An alkene, obtained by the dehydration of an alcohol, on ozonolysis gives acetaldehyde only as the product. The alcohol is:

A. $CH_3CH_2CH_2OH$

B. CH_3CH_2OH

C. $CH_3CH = CHCH_2OH$

D. $CH_3CH_2\underset{\underset{|}{OH}}{C}HCH_3$

Answer: D

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56. Which compound on reductive ozonolysis forms only glyoxal?

A. Ethyne

B. Ethene

C. Ethane

D. 1,3-butadiene

Answer: A

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57. 10 ml of a certain hydrocarbon require 55 mL of oxygen for complete combustion and the volume of CO_2 produced is 40 mL. What is the formula of hydrocarbon?

A. C_2H_2

B. C_2H_4

C. CH_4

D. C_2H_6

Answer: A

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58. During ozonolysis of $CH_2 = CH_2$ if hydrolysis is made in absence of Zn dust the products formed are:

A. HCHO

B. HCOOH

C. CH_3OH

D. CH_2OHCH_2OH

Answer: B

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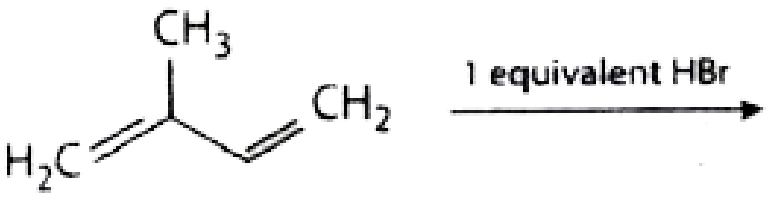
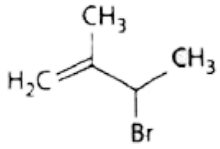
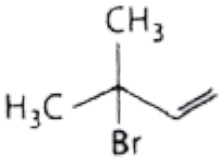
59. In the following reaction, the major product is



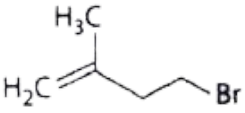
A.



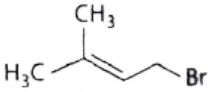
B.



C.



D.



Answer: D

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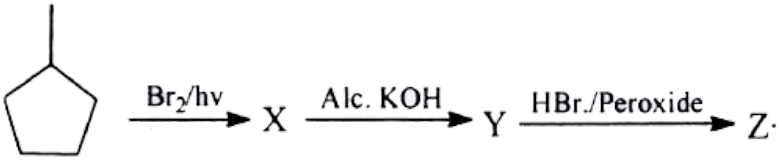
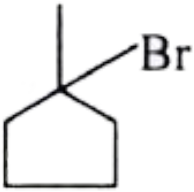
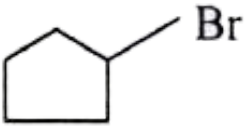
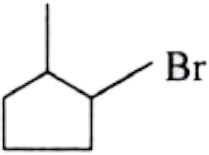
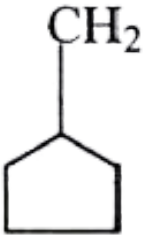


60. . The compound Z is

A. 

B. 

C. 

D. 

Answer: C

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61. The compound (i) decolourises $KMnO_4$ (ii) forms ozonide with ozone and (iii) undergoes polymerization. It will be :

A. C_6H_6

B. C_3H_8

C. C_2H_4

D. C_2H_6

Answer: C

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62. A hydrocarbon X adds on one mole of hydrogen to give hydrocarbon and decolourised bromine water. X reacts with $KMnO_4$ in presence of acid to give two mole of the same carboxylic acid. The structure of X is :

A. $CH_3CH = CHCH_2CH_2CH_3$

B. $CH_3CH_2CH = CHCH_2CH_3$

C. $CH_3CH_2CH_2 - CH = CHCH_3$

D. $CH_2 = CH - CH_2CH_2CH_3$

Answer: B

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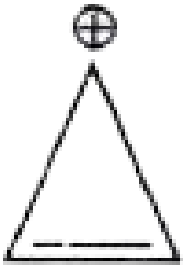
63. Which of the following molecules/species are aromatic in character?

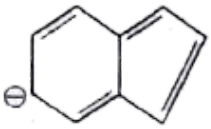
A.

B.

C.



D.



Answer: C

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64. In the reaction, $C_6H_5CH_3 \xrightarrow{\text{Oxidation}} A \xrightarrow{\text{NaOH}} B \xrightarrow[\Delta]{\text{Soda lime}} C$ the product C is :

A. C_6H_5OH

B. C_6H_6

C. C_6H_5COONa

D. C_6H_5Ona

Answer: B

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65. Benzene contains double bonds but does not give addition reactions because:

A. double bonds in benzene are strong

B. double bonds change their position rapidly

C. resonance lowers the energy of benzene molecule and leads to greater stabilisation

D. none of the above

Answer: C

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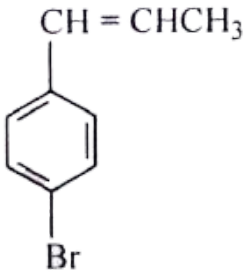
66. The reaction of $C_6H_5CH=CHCH_3$ with HBr produces:

$C_6H_5CH_2\underset{\underset{Br}{|}}{C}HCH_3, C_6H_5CH_2CH_2CH_3Br, C_6H_5\underset{\underset{Br}{|}}{C}HCH_2CH_3$

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

B. $C_6H_5CH_2CH_2CH_2Br$

C. 

D. $C_6H_5\underset{\underset{Br}{|}}{C}HCH_2CH_3$

Answer: D

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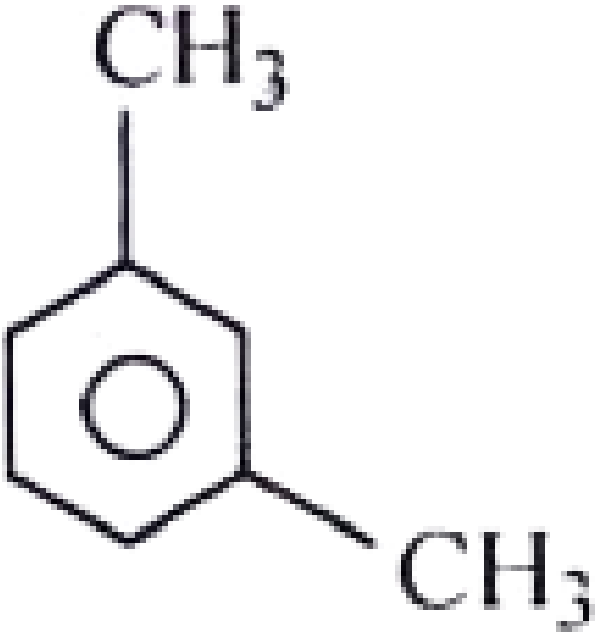
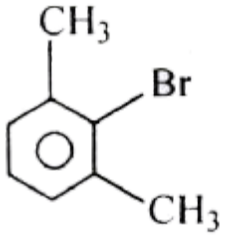
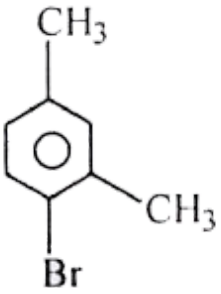
67. Which product is formed when the following compound is treated with Br_2 in the presence of $FeBr_3$?



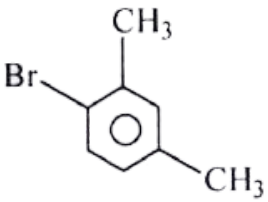
A.



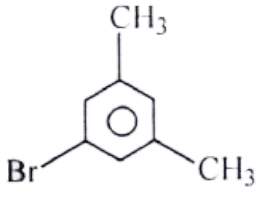
B.



C.



D.



Answer: C

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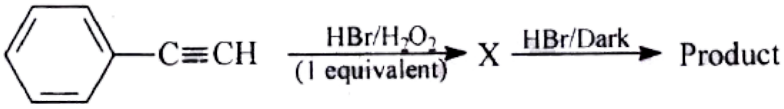
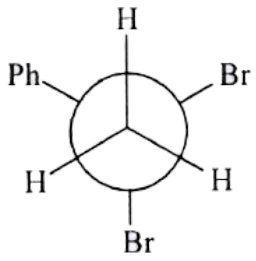
68. The most stable conformation of the product of following reaction is:



A.



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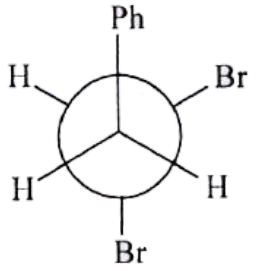

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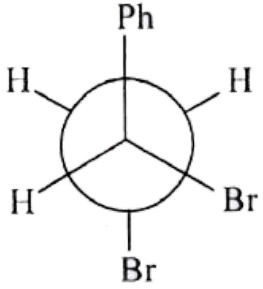

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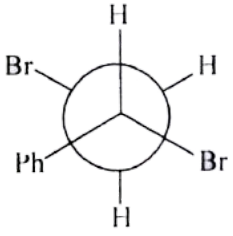

Answer: C

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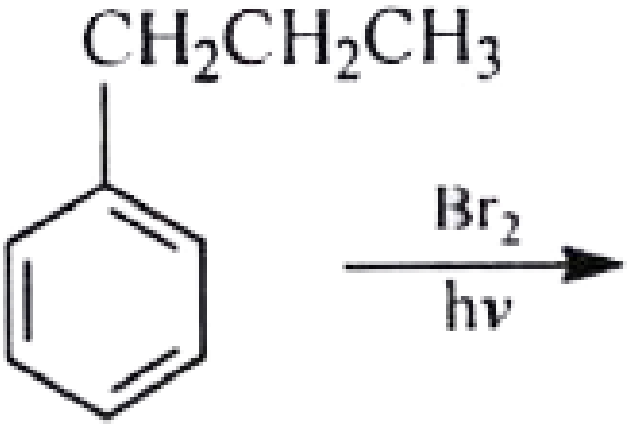
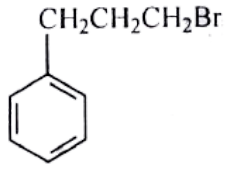
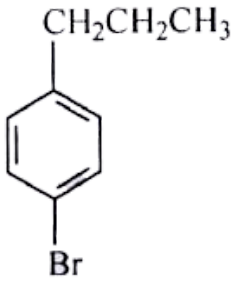
69. Provide the structure of the major product(s) from the following reaction.

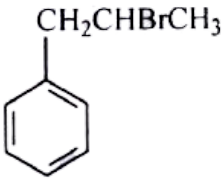


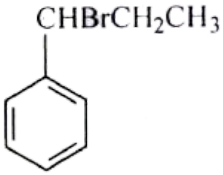
A.



B.



C. 

D. 

Answer: D

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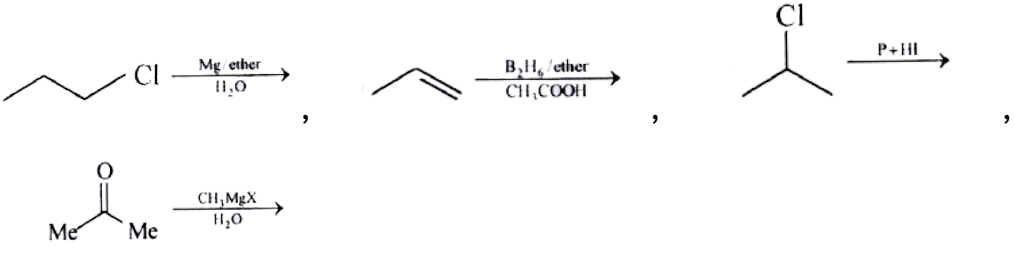
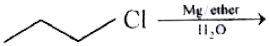
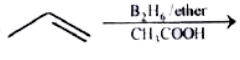
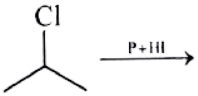
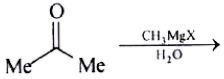
70. Which of the following reactions will not give propane? :



A. 

B. 

C. 

D. 

Answer: D

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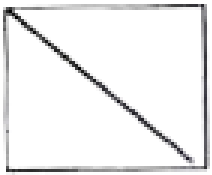
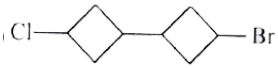
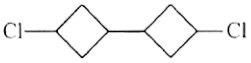
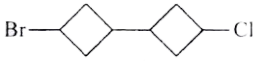
71. What would be the product formed when 1-bromo-3-chlorocyclobutane reacts with two equivalents of metallic sodium in water ?

A. 

B. 

C. 

D. 

Answer: C

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72. Out of the following compounds , I)Pent-1-ene , II)Pent-2-ene , III)2-Methyl but-1-ene , IV) 2-Methyl but-2-ene . Which pair has the lowest and the highest heats of combustion , respectively ?

A. (IV) and (I), respectively

B. (I) and (IV), respectively

C. (II) and (III), respectively

D. (III) and (II), respectively

Answer: A

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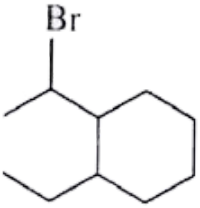
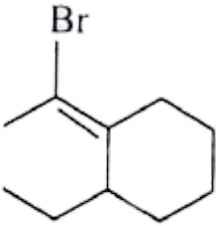
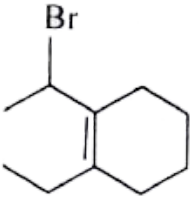
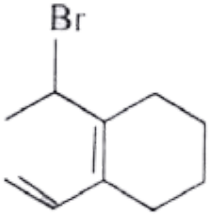
73. Which of the following will undergo faster dehydrobromination ?

A. 

B. 

C. 

D. 

Answer: D

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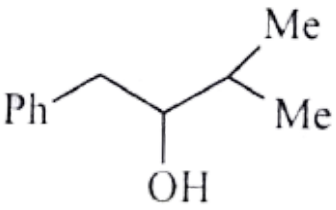
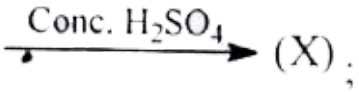
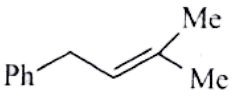
74. Match the following columns

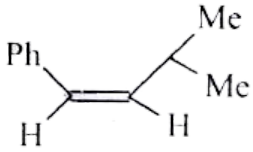




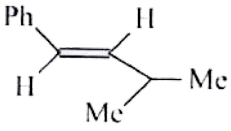
A.



B.



C.



D. All

Answer: C

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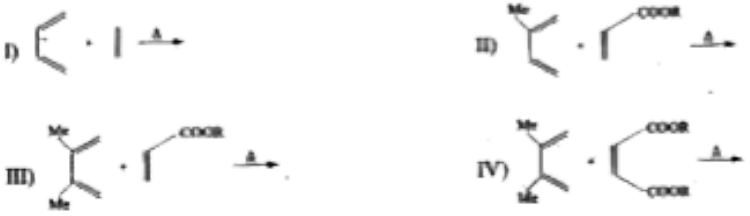
75. Give the decreasing order of reactivity of Diels-Alder reactions for the following :



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

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

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

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

Answer: B

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76. 2-Phenyl propene on acidic hydration gives :

A. 2-phenyl-2-propanol

B. 2-phenyl-1-propanol

C. 3-phenyl-1-propanol

D. 1-phenyl-2-propanol

Answer: A

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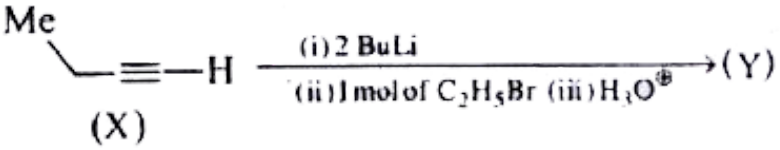
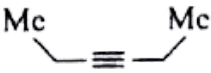
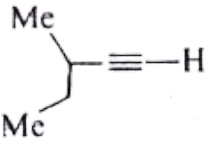
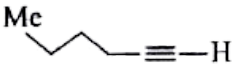
77.

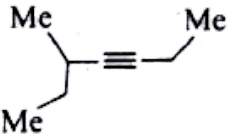


The product (Y) is

A. 

B. 

C. 

D. 

Answer: B

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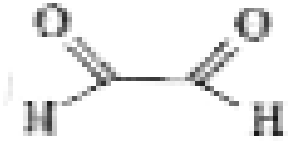
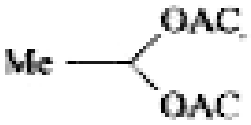
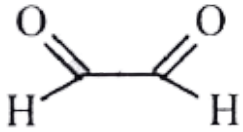
78. $H-\equiv-H \xrightarrow[(ii)\,H_2O/Zn]{(i)\,O_3} (X) \xrightarrow{Zn/CH_3COOH} (Y)$. Compound (Y) :



, $Me-COOH$, 

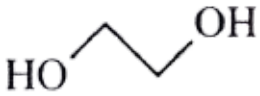
,



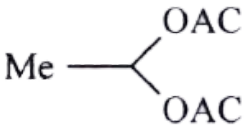


A.

B. Me - COOH



C.



D.

Answer: C

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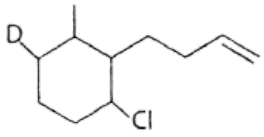
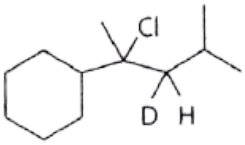
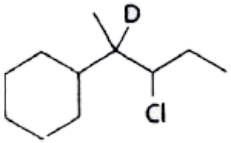
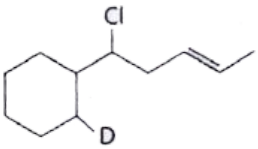
79. What product would you expect from addition of deuterium chloride to 2-cyclohexyl-4-methyl-2-pentene ?

A. 

B. 

C. 

D. 

Answer: B

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Level Ii Assertion Reason Type

1. Assertion : Chair conformation of cyclohexane is more stable than boat conformation.

Reason : In boat form, many hydrogen atoms on adjacent carbon atoms have eclipsed conformation.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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2. Assertion : 2-bromobutane on treatment with alcoholic KOH gives 2-butene.

Reason : Secondary hydrogen is more acidic than primary hydrogen.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: C

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3. Assertion : Ethene as well as benzene are planar molecules.

Reason : All the carbon atoms in ethene as well as benzene are sp^2

hybridized.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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4. Assertion : Benzene does not give addition reactions readily.

Reason : π-electrons are delocalised over the entire skeleton of six carbon atoms

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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5. Assertion : But-1-ene and 2-methylprop-1-ene are position isomers.

Reason : Position isomers have same molecular formula but different arrangement of carbon atoms.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: D

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6. Assertion : With respect to alkenes, the electrophilic addition reaction is reversible.

Reason : Because, the direction of the reaction is controlled by decrease in free energy of the reaction.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

View Text Solution

7. Assertion : Chlorination of methane is a free radical reaction.

Reason : Chlorination of methane takes place in sunlight.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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8. Assertion : trans-2-Butene on reaction with Br_2 gives meso-2,3-dibromobutane.

Reason : The reaction involves syn-addition of bromine.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: C

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9. Assertion : Acetylene on reacting with sodamide gives sodium acetylide and ammonia.

Reason : sp hybridised carbon atoms ofacetylene are considerably electronegative.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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10. Assertion : Friedel-Crafts reaction between benzene and acetic anhydride in the presence of anhydrous $AlCl_3$ yields acetophenone and not poly substituted products.

Reason : Acetophenone formed poisons the catalyst preventing further reaction.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: C

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11. Assertion : Dimethyl sulphide is commonly used for the reduction of an ozonide of an alkene to get the carbonyl compounds.

Reason : It reduces the ozonide giving water soluble dimethyl sulphoxide and excess of it evaporates.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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12. Assertion : The reaction of conc. HNO_3 and conc.H_2SO_4 on nitrobenzene gives m-dinitrobenzene.

Reason : The nitro group in benzene ring decreases the electron density in the benzene ring.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: B

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13. Assertion : Melting point of neopentane is higher than that of n-pentane but the boiling point of n-pentane is higher than that of neopentane.

Reason : Melting point depends upon packing of molecules in the crystal lattice while boiling point depends upon surface area of the molecule.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

14. Assertion : C-H bond in ethyne is shorter than C-H bonds in ethene. Reason : Carbon atom in ethene is sp hybridised while it is sp^3 in ethyne.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: C

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15. Assertion : Alkynes are more reactive towards nucleophilic addition reaction as compared to alkenes.

Reason : Alkynes contain two pi bonds, while alkenes have only one pi bond.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: B

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16. Assertion : Benzene does not decolourize Br_2-water.

Reason : Benzene is stabilized by resonance due to delocalization of π -electrons.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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17. Assertion : Pent-1-ene and pent-2-ene are position isomers.

Reason : Position isomers differ in the position of functional group or a substituent.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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18. Assertion : Butane and 2-methylbutane are homologues.

Reason : Butane is a straight chain alkane while 2-methyl-butane is a branched chain alkane.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: B

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19. Assertion : 2,3-dimethyl but-2-ene is more stable than but-2-ene.

Reason : 2,3-dimethyl but-2-ene possesses 12 α-hydrogen atoms whereas but-2-ene possesses only 6α-hydrogen atoms and therefore former shows more pronounced hyperconjugation.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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20. Assertion : Tropylium cation is aromatic in nature.

Reason : The only property that determines its aromatic behaviour is its planar structure.

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

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

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: C

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Level Iii Single Correct Answer Type

1. Sample of 2,3-dibromo-3-methylpentane is heated with zinc dust. The resulting product is isolated and heated with HI in the presence of phosphorous. Indicate which is the structure that represents the final organic product in the reaction?

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

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

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

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

Answer: B

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2. A hydrocarbon of formula C_6H_{10} absorbs only one molecule of H_2 upon catalytic hydrogenation. Upon ozonolysis the hydrocarbon yields, $O = \overset{H}{\underset{|}{C}} - CH_2 - CH_2 - CH_2 - CH_2 - \overset{H}{\underset{|}{C}} = O$. The hydrocarbon is:

A. cyclohexane

B. benzene

C. cyclohexene

D. cyclobutane

Answer: C

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

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

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

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

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

Answer: B

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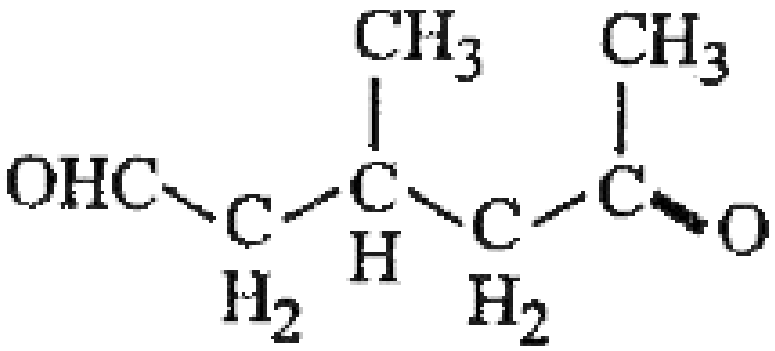
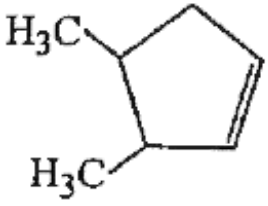
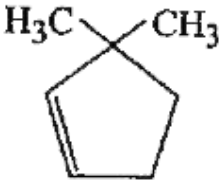
4. A single compound of the structure



is obtainable from ozonolysis of which of the following cyclic compounds?



A.



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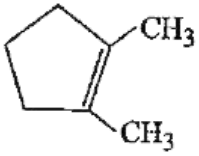
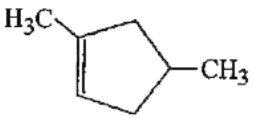


C.

D. 

Answer: D

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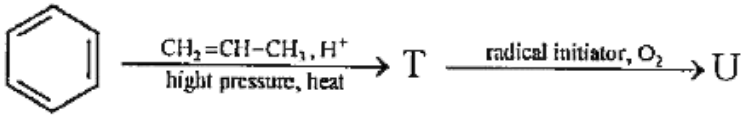
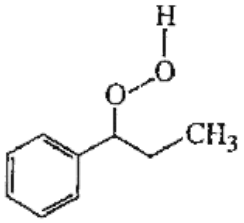
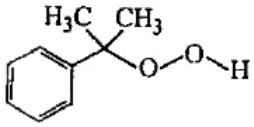
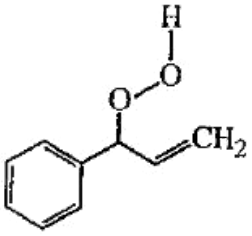
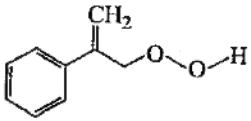
5. The major product 'U' in the following reactions is:



A. 

B. 

C. 

D. 

Answer: B

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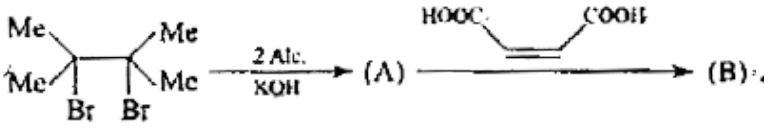
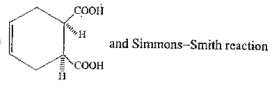
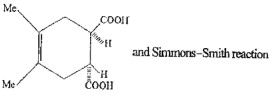
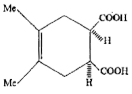
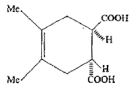
6. 

. Product (B) and name of the reaction in the formation of (B) are:

A. 

B. 

C.  and Diels–Alder reaction

D.  and Diels–Alder reaction

Answer: C

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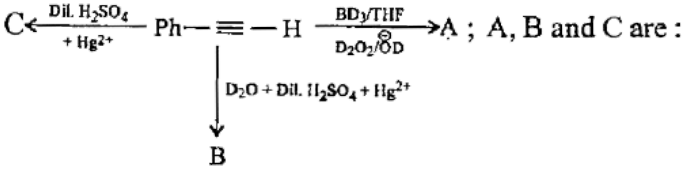
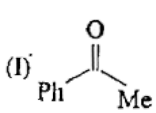
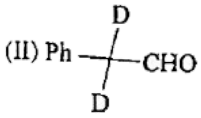
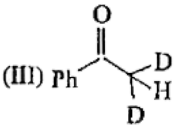
7. Match the following columns









A. (I), (II) and (III)

B. (II), (I), and (III)

C. (II), (III), and (I)

D. (I), (III), and (II)

Answer: C

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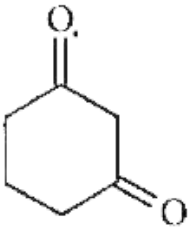
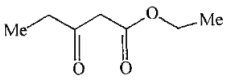
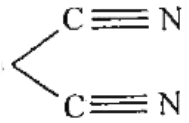
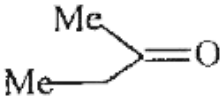
8. Which of the following compounds contain active methylene group?

A. 

B. 

C. 

D. 

Answer: A::B::C

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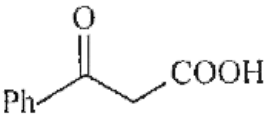
9. Which of the following compounds undergoes easy decarboxylation on heating?



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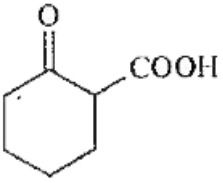

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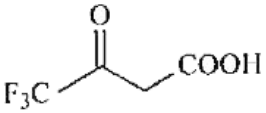

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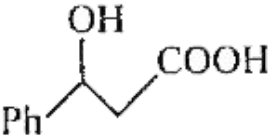
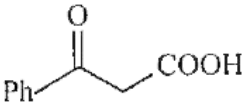
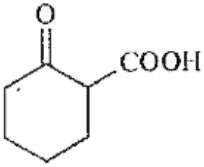
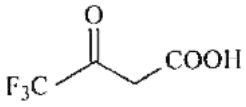


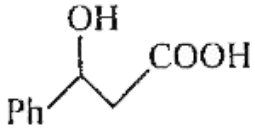
A.



B.



C. 

D. 

Answer: A::B

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10. Which of the statements are not correct?

A. Alkenes are more reactive than alkynes towards electrophilic addition reaction.

B. Alkynes are more reactive than alkenes towards nucleophilic addition reaction.

C. Towards catalytic hydrogenation, alkynes are more reactive than alkenes.

D. Towards catalytic hydrogenation, alkenes are more reactive than alkynes.

Answer: A::B::C

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11. Which statements are correct about the given reaction?

$$HC \equiv CH \xrightarrow[+Hg^{2+}]{Dil.\ H_2SO_4} CH_3CH = O$$

A. A.C atom accepting the H is reduced, and the C atom forming a bond with OH is oxidised.

B. B. Given reaction is a redox reaction.

C. C. The average oxidation number of the two C atoms in each compound is same (-1).

D. D. The average oxidation number of the two C atoms in each compound is same (-2). The net effect is no change in average oxidation state.

Answer: A::B::C

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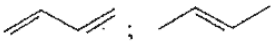
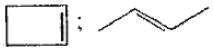
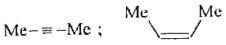
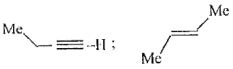
12. $\underset{(A)}{C_4H_6} \xrightarrow[1\text{ mol}]{H_2+Pt} \underset{(B)}{C_4H_8} \xrightarrow{O_3/H_2O}$ Acetic acid. (A) and (B) respectively are:

A. 

B. 

C. 

D. 

Answer: A::C

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13. Some oxidation reactions of methane are given below. Which of them 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. $2CH_{4(g)} + O_{2(g)} \xrightarrow{Cu\,/\,523\,/\,100\ \text{atm}} 2CH_3OH$

Answer: C::D

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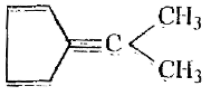
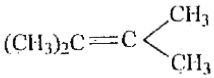
14. Which of the following alkenes on ozonolysis give a mixture of ketones only?

A. $CH_3 - CH = CH - CH_3$

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

C. 

D. 

Answer: C::D

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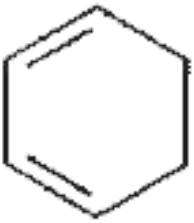
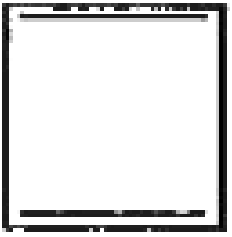
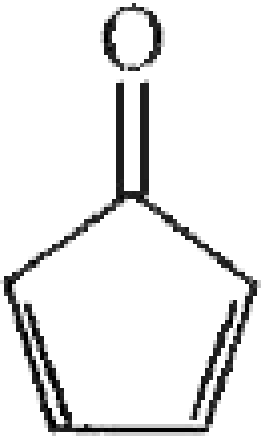
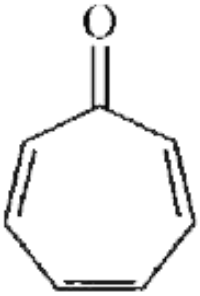
15. Which of the following molecules, in pure form are unstable at room temperature?  ,  ,





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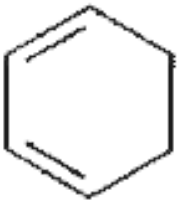
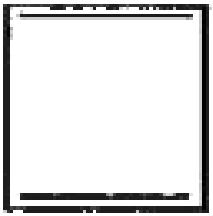


A.



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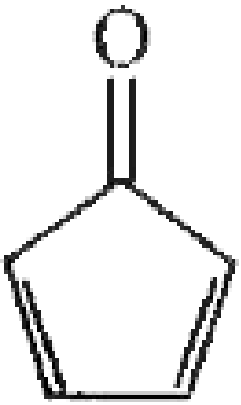

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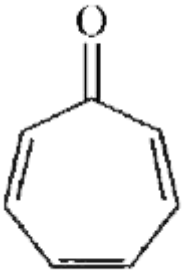

D.

Answer: B::C

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16. Which of the following statements is/are correct?

A. The reductive and oxidative ozonolysis of m-and p-xylenes give the same product

B. The reductive ozonolysis of o-xylene (1,2-dimethyl benzene) gives glyoxal + methylglyoxal + dimethyl glyoxal in 3 : 2 : 1 ratio.

C. The ozonolysis of o-xylene establishes the Kekule's structure of benzene and also proves the existence of resonance in benzene

D. The oxidation of benzene with acidic $KMnO_4$ gives 3 mol oxalic acid.

Answer: A::B::C

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17. Which of the following statements are correct. : Hydrogenation of but-2-yne in the presence of Lindlar's catalyst yields cis-but-2-ene; Hydrogenation of peni-2-yne in the presence of P-2 catalyst yields

trans-pent-2-ene; Hydrogenation of pent-2-yne in the presence of K (potassium) and liquid NH_3 yields trans-pent-2-ene; Hydrogenation of but-2-yne in the presence of $LiAlH_4$ yields cis-but-2-ene

A. Hydrogenation of but-2-yne in the presence of Lindlar's catalyst yields cis-but-2-ene

B. Hydrogenation of peni-2-yne in the presence of P-2 catalyst yields trans-pent-2-ene

C. Hydrogenation of pent-2-yne in the presence of K (potassium) and liquid NH_3 yields trans-pent-2-ene

D. Hydrogenation of but-2-yne in the presence of $LiAlH_4$ yields cis-but-2-ene

Answer: A::C

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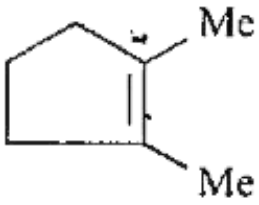
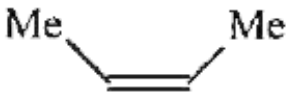
18. Hydroboration oxidation and acid hydration will yield the same



product in case of :

,

,



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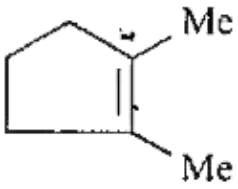
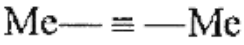
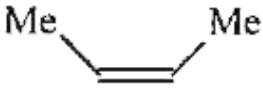


A.



B.



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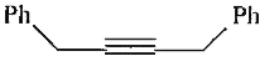

D.

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

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19. $CH \equiv CH + 2CH_3COOH \xrightarrow[2.\ \Delta\ ,300-400^\circ C]{1.\ Hg^{2+}}$ Products. Products are :

A. $CH_3 - CH(OCOCH_3)_2$

B. CH_3CHO

C. $CH_3 - \overset{O}{\overset{||}{C}} - OCH_3$

D. $CH_3 - \overset{O}{\overset{||}{C}} - O - \overset{O}{\overset{||}{C}} - CH_3$

Answer: B::D

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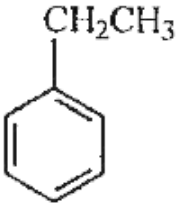
20. Benzoic acid may be prepared by the oxidation of

A.



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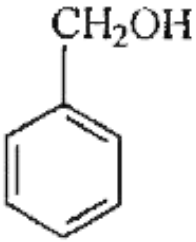
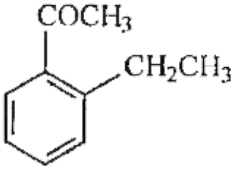
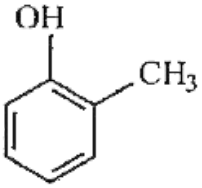


C.



D.



Answer: A::B

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Level Iii Numerical Type

1. How many of the following on reductive ozonolysis will give only glyoxal?

1,3-butadiene, ethylene, acetylene, o-xylene, m-xylene, p-xylene, benzene, cyclobutadiene, cyclooctatetraene.

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2. How many of the following species are aromatic in nature?

cyclopentadienyl cation, cyclopentadienyl anion, tropylium cation, cyclopropenyl cation, furan

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3. Which of the following molecules have zero dipole moment?

cis-1, 2-dichloroethene, trans-1, 2-dichloroethene, trans-2-pentene, cis-

2-pentene,

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4. how many alkenes are possible by the dehydrobromination of 3-bromo-3-cyclopentylhexane using alcoholic KOH is .....

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5. An alkyne having molecular mass x $\times$ 10 (A) is treated with Lindlar's catalyst and H_2 to give a compound (B). (B) reacts with HCl to give a compound (C). When (C) reacts with metallic sodium in presence of ether it gives (D). The molecular mass of (D) is 86. What is the value of x?

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6. How many eclipsed conformations are possible in butane?

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7. The number of π-bonds in the product formed by passing acetylene through dilute sulphuric acid containing mercuric sulphate is .....

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8. The number of meta directing groups among the following species are

$-NO_2,\ -SO_3H,\ -Cl,\ -OH,\ -NH_2,\ -CHO$

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Level Iii Matching Column Type

1. Match the following columns

Column I		Column II	
A)	Kolbe's electrolysis	p)	Alkanes
B)	Ozonolysis	q)	Alkenes
C)	Electrophilic substitution	r)	Alkynes
D)	Electrophilic addition	s)	Arenes

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2. Match the following columns

Column I		Column II	
A)	Addition of sulphuric acid to propene	p)	Anti-Markovnikov's addition
B)	Hydroboration-oxidation of propene	q)	Markovnikov's addition
C)	Hydroboration of propene	r)	n-Propyl alcohol
D)	Oxymercuration-demercuration of propene	s)	Isopropyl alcohol

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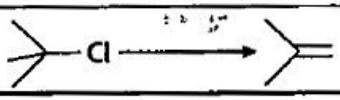
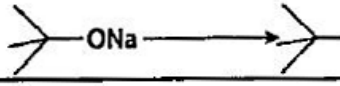
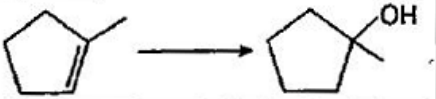
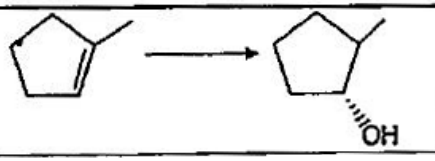
3. Match the chemical conversions in Column I with the appropriate reagents in Column II.

Column I	Column II
A) 	(p) 1. $Hg(OAc)_2$; 2. $NaBH_4$
B) 	(q) NaOEt
C) 	(r) EtBr
D) 	(s) 1. BH_3; 2. $H_2O_2/NaOH$

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4. Match the following columns

Column I		Column II	
Reactions		Products	
A)	Pent-2-yne $\xrightarrow[+Hg^{2+}]{\text{Dil. } H_2SO_4}$	p)	Rac-2, 3-Dibromo butane
B)	Pent-2-yne $\xrightarrow[(2)\ H_2O_2 + \overset{\ominus}{O}H]{(1)\ BH_3 + THF}$	q)	Meso-2, 3-Dibromo butane
C)	Pent-2-yne $\xrightarrow[(2)\ H_2O_2 + \overset{\ominus}{O}H]{(1)\ Sia_2BH}$	r)	Pentan-2-one
D)	But-2-yne $\xrightarrow[(2)\ Br_2]{(1)\ H_2 + Ni_2B}$	s)	Pentan-3-one
E)	But-2-yne $\xrightarrow[(2)\ Br_2]{(1)\ Na + EtOH}$		

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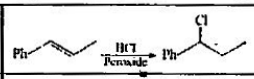
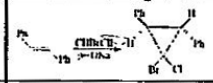
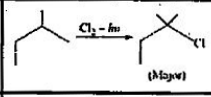
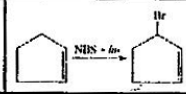
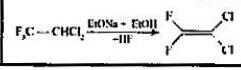
5. Match the following columns

Column I (Reactant, reagent and product)		Column II (Intermediate involved)	
A)		p)	Carbene
B)		q)	Free radical
C)		r)	Carbanion
D)		s)	Carbocation
E)			

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6. Match the following columns

Column I (Cyclohexane conformations)		Column II (Characteristics)	
A)	Chair form	p)	Four skew and two eclipsed positions
B)	Boat form	q)	Least stable form
C)	Half chair form	r)	Bond opposition strain
D)	Twist or skew boat form	s)	All (C – H) bonds on adjacent C are in skew position, ie, six skew positions
		t)	Free from angle strain

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Level Iii Statement Type

1. Statement 1 : Addition of bromine to butane gives 1,4-dibromobutane.

Statement 2 : Alkanes do not undergo addition reactions. : Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.; Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.; Statement 1 is True, Statement 2 is False.; Statement 1 is False, Statement 2 is True.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: D

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2. Assertion : Chair conformation of cyclohexane is more stable than boat conformation.

Reason : In boat form, many hydrogen atoms on adjacent carbon atoms have eclipsed conformation.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: A

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3. Assertion : Friedel-Crafts reaction between benzene and acetic anhydride in the presence of anhydrous $AlCl_3$ yields acetophenone and not poly substituted products.

Reason : Acetophenone formed poisons the catalyst preventing further reaction.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: C

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4. Assertion : The reaction of conc. HNO_3 and conc.H_2SO_4 on nitrobenzene gives m-dinitrobenzene.

Reason : The nitro group in benzene ring decreases the electron density in the benzene ring.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: B

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5. Assertion : Alkynes are more reactive towards nucleophilic addition reaction as compared to alkenes.

Reason : Alkynes contain two pi bonds, while alkenes have only one pi bond.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: B

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6. Assertion : Butane and 2-methylbutane are homologues.

Reason : Butane is a straight chain alkane while 2-methyl-butane is a branched chain alkane.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: B

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7. Assertion : Melting point of neopentane is higher than that of n-pentane but the boiling point of n-pentane is higher than that of

neopentane.

Reason : Melting point depends upon packing of molecules in the crystal lattice while boiling point depends upon surface area of the molecule.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: A

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Level Iii Linked Comprehension Type

1. 2-Phenyl propene on acidic hydration gives :

A. 2-phenyl-2-propanol

B. 2-phenyl-1-propanol

C. 3-phenyl-1-propanol

D. 1-phenyl-2-propanol

Answer: A

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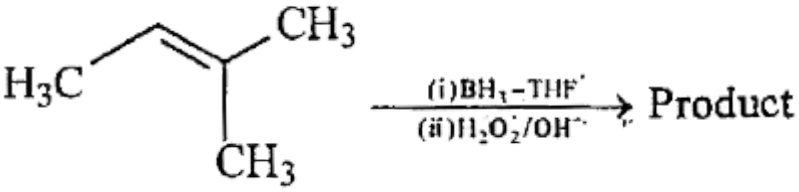
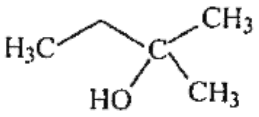
2. Acid catalysed hydration of alkene gives alcohol. In this reaction addition of water takes place according to Markownikoff's rule. Since intermediate carbocation is formed in this reaction, rearrangement of carbocation takes place. In oxymercuration-demercuration reaction hydration of alkene takes place according to Markownikoff's rule. Oxymercuration demercuration is a better process than the catalytic hydration of alkene because in oxymercuration-demercuration, no

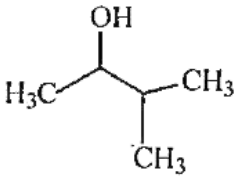
rearrangement is possible. In hydroboration oxidation, hydration of alkene takes place as if it is according to anti-Markownikoff's addition. In hydroboration oxidation reaction rearrangement is not possible. Both in oxymercuration-demercuration and hydroboration oxidation intermediate carbocation are not formed.

The product formed in the following reaction is





A.



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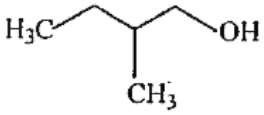
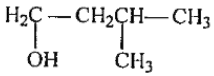


C.

D. 

Answer: B

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3. Acid catalysed hydration of alkene gives alcohol. In this reaction addition of water takes place according to Markownikoff's rule. Since intermediate carbocation is formed in this reaction, rearrangement of carbocation takes place. In oxymercuration-demercuration reaction hydration of alkene takes place according to Markownikoff's rule. Oxymercuration demercuration is a better process than the catalytic hydration of alkene because in oxymercuration-demercuration, no rearrangement is possible. In hydroboration oxidation, hydration of alkene takes place as if it is according to anti-Markownikoff's addition. In hydroboration oxidation reaction rearrangement is not possible. Both in oxymercuration-demercuration and hydroboration oxidation intermediate carbocation are not formed.

$CH_3 - C = C - H \xrightarrow[(ii)\, H_2O_2 / OH^-]{(i)\, B_2H_6} A.$ A is : $CH_3 - CH_2 - CHO$,

$H_3C - \underset{\underset{O}{||}}{C} - CH_3, CH_3 - CHO, CH_3 - CH_2 - CH_2 - OH$

A. $CH_3 - CH_2 - CHO$

B. $H_3C - \underset{\underset{O}{||}}{C} - CH_3$

C. $CH_3 - CHO$

D. $CH_3 - CH_2 - CH_2 - OH$

Answer: A

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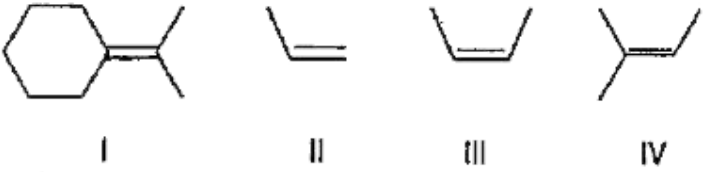
4. Alkenes on catalytic hydrogenation give alkanes. The reactions are exothermic. The heat of hydrogenation is a measure of stability of alkene. Lesser the heat of hydrogenation more stable the alkene.

The relative rate of catalytic hydrogenation of the following alkenes is



A. $II > III > IV > I$

B. $I > IV > III > II$

C. $II > IV > I > III$

D. $III > IV > I > II$

Answer: A

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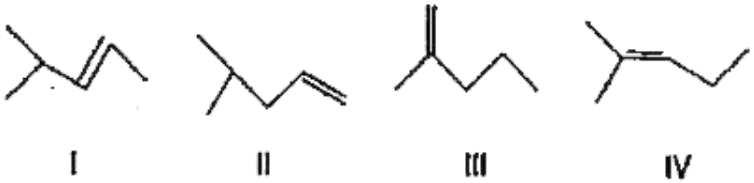
5. Alkenes on catalytic hydrogenation give alkanes. The reactions are exothermic. The heat of hydrogenation is a measure of stability of alkene. Lesser the heat of hydrogenation more stable the alkene.

The correct order of heat of hydrogenation is



A. $IV > III > I > II$

B. $II > I > III > IV$

C. $IV > III > II > I$

D. $II > III > I > IV$

Answer: B

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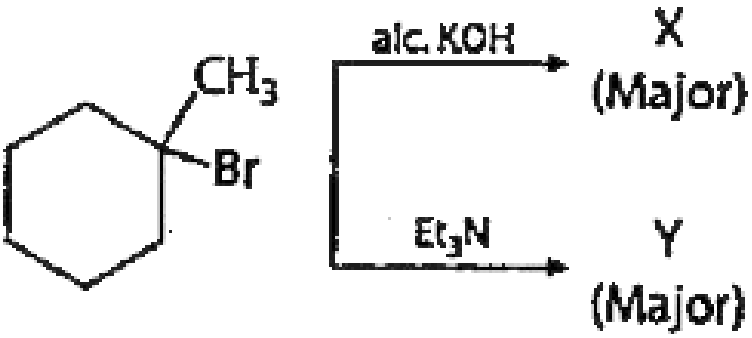
6. Alkenes on catalytic hydrogenation give alkanes. The reactions are exothermic. The heat of hydrogenation is a measure of stability of alkene. Lesser the heat of hydrogenation more stable the alkene.



. Which of the following statement is true ?

A. The heat of hydrogenation of X is more than Y

B. The heat of hydrogenation of Y is more than X

C. Both X and Y has the same heat of hydrogenation

D. Both X and Y have same reactivity towards catalytic hydrogenation

Answer: B

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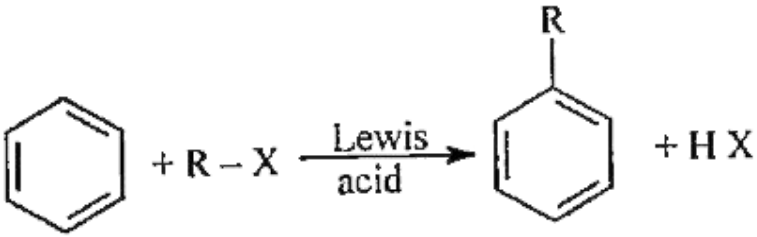
7. The reaction given below is an example of Friedel-Craft alkylation reaction.



What is electrophile in given reaction?

A. X^+

B. R^+

C. $(\text{Lewis acid X})^+$

D. none of the above

Answer: B

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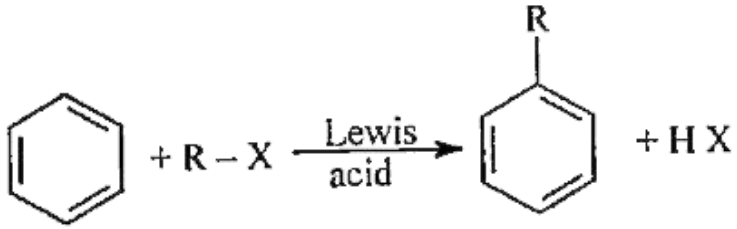
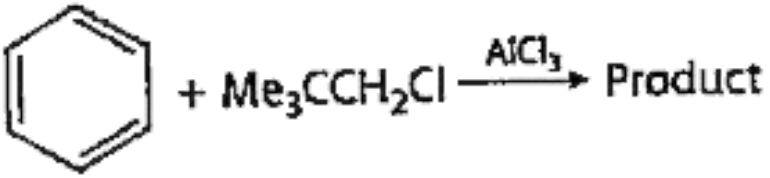
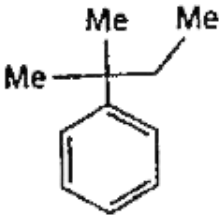
8. The reaction given below is an example of Friedel-Craft alkylation reaction.



In number of cases of Friedel-Crafts alkylation, the final product is found to contain a rearranged alkyl group. Generally with stronger Lewis acid product is rearranged due to enough polarization of complex while with weak lewis acid no such effect is observed. Temperature also favours rearranged product.

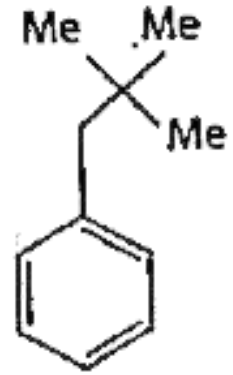


. Product is

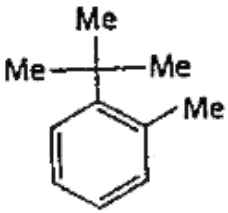


A.

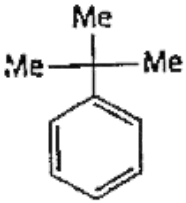
B.



C.



D.



Answer: A

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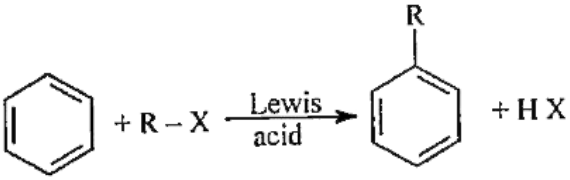
9. The reaction given below is an example of Friedel-Craft alkylation reaction.



In number of cases of Friedel-Crafts alkylation, the final product is found to contain a rearranged alkyl group. Generally with stronger Lewis acid product is rearranged due to enough polarization of complex while with weak lewis acid no such effect is observed. Temperature also favours rearranged product.

If we take $FeCl_3$ in place of $AICI_3$ in the above reaction, the product is

A. only (A)

B. Only (B)

C. (A) and (B) both can be possible

D. Not given

Answer: A

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