CHEMISTRY

BOOKS - MBD CHEMISTRY (ODIA ENGLISH)

ORGANIC CHEMISTRY : SOME BASIC PRINCIPLES AND TECHNIQUES

Question Type

1. Which of the following compounds has isopropyl group

A. 2,2,3,3-tetramethylpentane

B. 2,2-dimethylpentane

C. 2,2,3-trimethylpentane

D. 2-methylpentane

Answer: D

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2. IUPAC name of,

$CH_3CH(OH)CH_2CH_2COOH$ is:

A. 4-hydroxypentanoic acid

B. 1-carboxy-3-butanoic acid

C. 1-carboxy-4-butanol

D. 4-carboxy-2-butanol

Answer: A

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3. Isobutyl chloride is:

A. $CH_3CH_2CH_2CH_2Cl$

B. $(CH_3)_2CHCH_2Cl$

C. $CH_3CH_2CHClCH_3$

D. $(CH_3)_3C - Cl$

Answer: B

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4. Which of the following is an optically active compounds ?

A. CH_3CH_2COOH

B. $CH_3CHOHCOOH$

C. $HOOCCH_2COOH$

D. $CH_3COCOOH$

Answer: B

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5. Removal of a hydride ion from a methane molecule will give a:

A. Methyl radical

B. Carbonium ion

C. Carbanion

D. Methyl group

Answer: B

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6. A compound not isomeric with diethyl ether is:

A. Methyl propyl ether

B. Butan-1-ol

C. 2-methylpropan-2-ol

D. Butanone

Answer: D

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7. S_N^1 reaction on optically active substrates mainly gives:

A. Retention in configuration

B. Inversion in configuration

C. Racemic product

D. No product

Answer: C

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8. IUPAC name of the compound, $Cl - CH_2CH_2COOH$ is:

A. 3-chloropropanoic acid

B. 3-chloropropanoic acid

C. 2-chloroethanoic acid

D. Chlorosuccinic acid

Answer: A

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9. IUPAC name of $CH \equiv C - C(CH_3)_3$ is :

A. 2,2-dimethyl prop-1yne

B. 3,3-dimethyl but-1yne

C. 2-vinylpropane

D. 1-isopropyiethene

Answer: B

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10. IUPAC name of $CH_3OC_2H_5$ is:

A. Methoxy ethane

B. Ethoxy methane

C. Methyl ethyl ether

D. Ethyl methyl ether

Answer: A

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11. Which is isomer ?

A. Ethanol and ethoxyethane

B. Methanol and methoxymethane

C. Propionic acid and propyl acetate

D. Propanal and acetone

Answer: D

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12. An isomer of ethanol is:

A. Methanol

B. Dimethyl ether

C. Diethyl ether

D. Ethylene glycol

Answer: B

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13. Heterolysis of carbon-chlorine bond produces:

A. Two free radicals

B. Two carbonium ions

C. Two carbonium

D. One cation and one anion

Answer: D

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14. Which of the following is an isomer of diethyl ether ?

A. $(C_2H_5)_2CHOH$

B. C_3H_7OH

C. $(CH_3)_3COH$

D. $(CH_3)_2CHOH$

Answer: C

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15. In CCl_4, the four valencies of carbon are directed towards the corners of a:

A. Square

B. Rectangle

C. Rhombus

D. Tetrahedron

Answer: D

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16. The $C = C$ bond length in ethylene is:

A. 1.34 $\overset{\circ}{A}$

B. 1.20 $\overset{\circ}{A}$

C. 1.39 $\overset{\circ}{A}$

D. 1.54 $\overset{\circ}{A}$

Answer: A

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17. The $C - C$ bond length in ethane is:

A. 1.20 $\overset{\circ}{A}$

B. 1.34 $\overset{\circ}{A}$

C. 1.54 $\overset{\circ}{A}$

D. 1.39 $\overset{\circ}{A}$

Answer: A

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18. Addition of Br_2 on cis-butene-2 gives:

A. A racemic mixture of 2,3-dibromo butane

B. Meso form of 2,3-dibromobutane

C. Dextro form of 2,3-dibromobutane

D. Laevo form of 2,3-dibromobutane

Answer: A

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19. The compound which exhibits optical isomerism is:

A. $CH_3CHOHCH_3$

B. $(CH_3)_2CHCH_2CH_3$

C. $CH_3CHClCH_2CH_3$

D. $CH_3CCl_2CH_2CH_3$

Answer: C

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20. In benzene molecule there are 3π-bonds and:

A. 10 σ-bond

B. 12 σ-bond

C. 3 σ-bond

D. 6 σ-bond

Answer: B

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21. The addition of HBr on butene-2 in presence of peroxide follow the:

A. Electrophilic addition

B. Free radical addition

C. Nucleophilic addition

D. None of the above

Answer: B

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22. The addition of HBr on butene-2 is an example of:

A. Nucleophilic addition

B. Free radical addition

C. Electrophilic addition

D. None of these

Answer: C

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23. Benzene molecule contains following hybrid orbitals:

A. 6 sp^2

B. 3 sp^2

C. 6 sp^3

D. 3 sp^3

Answer: A

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24. The property by virtue of which a compound can turn the plane of polarization of light is known as:

A. Photolysis

B. Phosphorescence

C. Optical activity

D. Polarization

Answer: C

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25. Which of the following is paramagnetic ?

A. A carbonium ion

B. A free radical

C. A carbanion ion

D. All of the above

Answer: B

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26. Which is most commonly used to dry organic liquids ?

A. Lithium

B. Sodium

C. Potassium

D. Rubidium

Answer: B

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27. The compound having molecular formula $C_4H_{10}O$ can show:

A. Metamerism

B. Functional isomerism

C. Positional isomerism

D. All of the above

Answer: D

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28. The organic liquid that mix freely with water is:

A. $CHCl_3$

B. CCl_4

C. CS_2

D. C_2H_5OH

Answer: D

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29. Electrophiles are:

A. Electron loving

B. Electron hating

C. Nucleus loving

D. Nucleus hating

Answer: A

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30. Nucleophiles are:

A. Electron loving

B. Electron hating

C. Nucleus loving

D. Nucleus hating

Answer: C

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31. The HCC bond angle in acetylene is:

A. 90°

B. 120°

C. $109^\circ 28'$

D. 180°

Answer: D

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32. Ethanol and methoxy methane are:

A. Chain isomers

B. Functional isomers

C. Positional isomers

D. Optical isomers

Answer: B

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33. $CH_3CH_2CH_2OH$ is the functional isomer of:

A. $CH_3OC_2H_5$

B. $C_2H_5OC_2H_5$

C. $CH_3COC_2H_5$

D. None of the above

Answer: A

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34. Which of the following is strongest nucleophile ?

A. Br^-

B. $\overset{\Theta}{:}OH$

C. $\overset{\Theta}{:}CN$

D. $C_2H_5O\overset{\Theta}{:}$

Answer: D

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35. How many primary carbon atoms are there in the compound butane

A. 6

B. 2

C. 4

D. 3

Answer: A

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36. Reactions involving heterolytic fission are said to proceed via:

A. Ionic mechanism

B. Polar mechanism

C. BOTH (A) AND (B)

D. None of the above

Answer: C

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37. Which of the following molecules contain asymmetric carbon atom ?

A. $CH_3CHClCOOH$

B. CH_3CH_2COOH

C. $ClCH_2.CH_2COOH$

D. $Cl_2CHCOOH$

Answer: A

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38. In benzene, all the C-C bonds are of equal length because of:

A. Isomerism

B. Resonance

C. Tautomerism

D. Inductive effect

Answer: B

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39. Hyper conjugation is:

A. $\sigma - \pi$ conjugation

B. Noticed due to delocalisation of σ and π-bonds

C. No bond resonance

D. All of the above

Answer: D

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40. In hyper conjugation, the atom involved is:

A. β-H atom

B. α-H atom

C. γ-H atom

D. All of these

Answer: B

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41. Which of the following is not electrophile ?

A. BF_3

B. Hg^{2+}

C. $AlCl_3$

D. NH_3

Answer: D

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42. Pi - molecular orbitals can result from the overlapping of:

A. p-orbitals

B. sp^2-orbitals

C. s-orbitals

D. sp-orbitals

Answer: A

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43. Ease of abstraction of hydrogen is greater when attached to:

A. 1° carbon

B. 2° carbon

C. 3° carbon

D. Neo-carbon

Answer: C

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44. Which species is paramagnetic ?

A. Carbonium ion

B. Carbanion

C. Free radical

D. None of these

Answer: C

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45. Aromaticity in benzene is due to:

A. Three double bonds

B. A ring

C. Delocalisation of π-electrons

D. None of the above

Answer: C

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46. Which of the following possesses an sp-hybridised carbon in its structure:

A. $CCl_2 = CCl_2$

B. $CH_2 = C = CH_2$

C. $CH_2 = CH - CH - CH_2$

D. $CH_2 = CCl - CH = CH_2$

Answer: B

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47. Metamerism is shown by:

A. Ethyl alcohol and dimethyl ether

B. Acetone and propionaldehyde

C. Propionic acid and acetic acid

D. Methyl n-propyl ether and diethyl ether

Answer: D

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48. Which of the following is an electrophile ?

A. BCl_3

B. CH_3OH

C. NH_3

D. $AlCl_4^-$

Answer: A

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49. Which of the following is an electrophile reagent ?

A. RO^-

B. BF_3

C. NH_3

D. ROH

Answer: B

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50. Electrophiles are:

A. Lewis bases

B. Lewis acids

C. Amphoteric

D. None of the above

Answer: B

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51. The increasing order of + I effect shown by H, CH_3, C_2H_5 and C_3H_7 is:

A. $H > CH_3 < C_2H_5 < C_3H_7$

B. $H < CH_3 < C_2H_5 > C_3H_7$

C. $H < C_2H_5 < CH_3 < C_3H_7$

D. None of these

Answer: A

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52. Which of the following is an electrophile reagent ?

A. H_2O

B. OH^-

C. NO_2^+

D. None of the above

Answer: C

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53. The reaction,

$C_2H_5I + KOH \rightarrow C_2H_5OH + KI$ is called :

A. Hydroxylation substitution

B. Electrophilic substitution

C. Nucleophilic substitution

D. Dehydroiodination

Answer: C

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54. Homologous compounds have:

A. Same chemical properties

B. Same molecular weight

C. Same physical properties

D. Same melting point and boiling point

Answer: A

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55. To which ring size cycloalkanes, Baeyer's strain theory is not valid ?

A. 3 carbon

B. 4 carbon

C. 5 carbon

D. $\geq$ 6 carbon

Answer: D

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56. The first organic compound was synthesized in the laboratory by:

A. Kekule

B. Liebig

C. Lavoisier

D. Wohler

Answer: D

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57. Which of the following are position isomers ?

A. CH_3OCH_3 and C_2H_5OH

B. n-butane and isobutane

C. Ortho-xylene and meta-xylene

D. None of the above

Answer: C

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58. Which of the following compounds give two geometrical isomers?

A. Ethylidene bromide

B. Acetylene tetrachloride

C. Acetylene tetrabromide

D. Acetylene dibromide

Answer: D

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59. Of the following compounds which will have a zero dipole moment ?

A. 1,1-dichloroethylene

B. Trans-1,2-dichloroethylene

C. Cis-1,2-dichloroethylene

D. None of the above

Answer: B

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60. Only two isomeric monochloro derivatives are possible for:

A. n-butane

B. 2,4-dimethylpentane

C. Benzene

D. 2-methylbutane

Answer: A

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61. Anti Markonikov's rule only applicable for addition of:

A. Br_2

B. H_2S

C. HF

D. HBr

Answer: D

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62. Write the order of stability of carbanions ?

A. $CH_3^- > 1^\circ > 2^\circ > 3^\circ$

B. $3^\circ > 2^\circ > 1^\circ > CH_3^-$

C. $3^\circ > 1^\circ > 2^\circ > CH_3^-$

D. $2^\circ > 3^\circ > 1^\circ > CH_3^-$

Answer: A

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63. The reagent used in dehydrohalogenation process is:

A. Alcoholic KOH

B. $NaNH_2$

C. C_2H_5ONa

D. All of these

Answer: D

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64. A carbonium ion is formed when a covalent bond between two atoms in an organic compound undergoes:

A. Homolysis

B. Heterolysis

C. Cracking

D. Pryrolysis

Answer: B

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65. In carbonium ion the carbon bearing the positive charge is:

A. sp-hybridised

B. sp^2-hybridised

C. sp^3-hybridised

D. None of these

Answer: B

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66. An organic compound $C_5H_{11}X$ an dehydro-halogenation gives pentene-2 only. What is halide ?

A. $CH_3CH_2CHXCH_2CH_3$

B. $(CH_3)_2CHCHXCH_3$

C. $CH_3CH_2CH_2CHXCH_3$

D. $CH_3CH_2CH_2CH_2CH_2X$

Answer: A

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67. The reaction, $CH_2 = CHCHO \xrightarrow{HX}$ give:

A. $CH_3CHXCHO$

B. CH_2XCH_2CHO

C. $CH_2 = CHCHX_2$

D. None of the above

Answer: B

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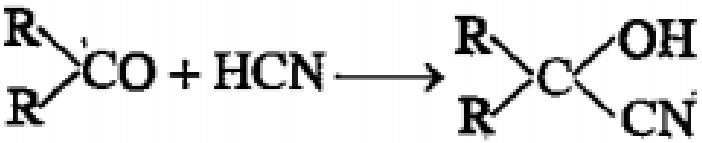
68. Reaction,



A. Electrophilic substitution

B. Nucleophilic substitution

C. Electrophilic addition

D. Nucleophilic addition

Answer: D

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69. Which one is an elimination reaction ?

A. $CH_3CH_3 + Cl_2 \rightarrow CH_3CH_2Cl + HCl$

B. $CH_3Cl + KOH(aq) \rightarrow CH_3OH + KCl$

C. $CH_2 = CH_2 + Br_2 \rightarrow CH_2BrCH_2Br$

D.

$$C_2H_5Br + KOH(alc.) \rightarrow C_2H_4 + KBr + H_2O$$

Answer: D

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70. Intermediate product formed in the acid catalysed dehydration of n-propyl alcohol is:

A. $CH_3 - CH_2 - CH_3$

B. $CH_3 - CH - CH_2^+$

C. $CH_3 - CH^+ - CH_3$

D. $CH_3 - CH_2 - CH_2$

Answer: C

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71. The compounds CH_3NH_2 and $CH_3CH_2.NH_2$ are :

A. Isomers

B. Isobars

C. Homologues

D. Allotropes

Answer: C

72. Glucose and fructose are :

A. Chain isomers

B. Position isomers

C. Functional isomers

D. Optical isomers

Answer: C

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73. In CH_3CH_2OH the bond that undergoes heterolytic cleavage nost readily is:

A. C - C

B. C - O

C. C - H

D. O - H

Answer: B

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74. The Cl-C-Cl angle in 1,1,2,2-tetra-chloroethene and tetrachloromethane respectively will be about:

A. 120° and 109.5°

B. 90° and 109.5°

C. 109.5° and 90°

D. 109.5° and 120°

Answer: A

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75. Lactic acid, $CH_3CH(OH)COOH$ molecule shows:

A. Geometrical isomerism

B. Metamerism

C. Optical isomerism

D. Tautomerisms

Answer: C

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76. Which one of the following compounds is completely miscible with water ?

A. CCl_4

B. C_2H_5OH

C. $CHCl_3$

D. C_6H_6

Answer: B

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77. An organic compound must contain:

A. Oxygen

B. Carbon

C. Hydrogen

D. Nitrogen

Answer: B

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78. Resonance in benzene is accompained by delocalisation of $\pi -$ electron is attached with:

A. 4 carbon

B. 2 carbon

C. 3 carbon

D. 6 carbon

Answer: D

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79. Optically active isomers are also called:

A. Epimers

B. Anomers

C. Conformers

D. Enantiomers

Answer: D

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80. The resonating structures:

A. Differ only in the arrangement of electrons

B. Differ in number of paired and unpaired electrons

C. Differ largely in their energy contents

D. Do not lie in the same plane

Answer: A

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81. The number of sigma and pi bonds in 1 - butene 3 - yne are:

A. $5\sigma -$ and $5\pi -$

B. $7\sigma -$ and $3\pi -$

C. $8\sigma -$ and $2\pi -$

D. $8\sigma -$ and $4\pi -$

Answer: B

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82. The species which use sp^2-hybrid orbitals in its bonding:

A. PH_3

B. NH_3

C. CH_3^+

D. CH_4

Answer: C

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83. Which of the following is nucleophile ?

A. OH^-

B. ROR

C. R-OH

D. All of these

Answer: D

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84. The number of optical enantiomrs of tartaric acid:

A. 3

B. 2

C. 4

D. 1

Answer: B

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85. A neutral divalent carbon intermediate is called:

A. Free radical

B. Carbanion

C. Carbonium ion

D. Carbene

Answer: D

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86. Which of the following compounds will exhibit geometrical isomerism ?

A. 1-Phenyl-2-butene

B. 3-Phenyl-1-butene

C. 2-Phenyl-1-butene

D. 1,1-diphenyl-1-propene

Answer: A

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87. The correct statement regarding the racemic mixture is that :

A. It is optically active

B. It is dextrorotatory

C. It is optically inactive

D. None of these

Answer: C

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88. Which group has the highest + Inductive effect ?

A. CH_3^-

B. $CH_3CH_2^-$

C. $(CH_3)_2CH^-$

D. $(CH_3)_3C^-$

Answer: D

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89. A racemic mixture is a mixture of:

A. Meso and its isomers

B. d- and its l-isomers in equal proportions

C. d- and its l-isomers in different proportions

D. Meso and d-isomers

Answer: B

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90. The production of an optically active compound from a symmetric molecule without resolution is called :

A. Walden inversion

B. Asymmetric synthesis

C. Partial racemisation

D. None of these

Answer: B

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91. A free radical is:

A. Non existing

B. Short lived

C. Diamagnetic

D. Fairly stable

Answer: B

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92. Which is the active species for the nitration ?

A. NO_2

B. NO^+

C. NO_2^+

D. NO_3^+

Answer: C

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93. Heterolytic cleavage of a covalent bond gives only:

A. Cationic species

B. Anionic species

C. Both of the above

D. Free radicals

Answer: C

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94. The bond energy for catenation next to carbon is:

A. N

B. S

C. Si

D. P

Answer: C

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95. n-pentane and neopentane are:

A. Functional isomers

B. Geometrical isomers

C. Chain isomers

D. Position isomers

Answer: C

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96. The most abundant organic compound in the world is:

A. CH_4

B. Chlorophyll

C. Alkaloids

D. Cellulose

Answer: D

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97. Which one of the following compounds exhibits strongest hydrogen bonding:

A. $R - O - R$

B. $R - CH_2OH$

C. RCH_2NHCH_3

D. RNH_2

Answer: A

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98. Select the organic compounds which burn with non smoky flame:

A. $CHCl_3$

B. C_6H_6

C. $C_6H_5CH_2OH$

D. C_6H_5CHO

Answer: C

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99. Which of the following is the correct order of stability of different conformations of butane ?

A. staggered > Gauche > Partially eclipsed > fully eclipsed

B. Gauche > Staggered > Partially eclipsed > Fully eclipsed`

C. Staggered > Fully eclipsed > Partially eclipsed > Gauche`

D. None of the above

Answer: A

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100. The attacking species in the aromatic sulphonation is:

A. SO_3H^+

B. $H_3SO_4^+$

C. HSO_4^-

D. SO_3

Answer: D

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101. The number of isomeric xylenes is:

A. 3

B. 2

C. 4

D. 5

Answer: A

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102. The type of isomerism observed in urea molecule is:

A. Chain

B. Position

C. Tautomerism

D. Functional

Answer: D

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103. Geometrical isomerism can exist only when the molecule:

A. Has a centre of symmetry

B. Has plane of symmetry

C. Has two different groups attached to both the carbon atoms of the double bond

D. Rotates the plane polarised light to the particular direction

Answer: C

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104. Which of the following is free radical ?

A. Cl^+

B. Cl^-

C. $Cl^{\cdot}$

D. NO_2^+

Answer: C

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105. A solution of (+)-2-chloro-2-phenylethane in toluene racemises slowly in the presence of small amounts of $SbCl_5$, due to the formation of:

A. Carbanion

B. Carbene

C. Free radical

D. Carbocation

Answer: D

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106. A secondary (2°) carbon atom is one that is joined to:

A. 1-alkyl group

B. 2-alkyl group

C. 3-alkyl group

D. None of these

Answer: B

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107. The +I effect is shown by:

A. $-CH_3$

B. -OH

C. -F

D. $-C_6H_5$

Answer: A

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108. The -I effect is shown by:

A. -COOH

B. $-CH_3$

C. $-CH_2CH_3$

D. $-CHR_2$

Answer: A

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109. 2-methylpent-3-enoic acid shows:

A. Optical isomerism

B. Geometrical isomerism

C. BOTH (A) AND (B)

D. None of the above

Answer: C

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110. Species containing carbon with three bonds and an electron are called:

A. Carbenes

B. Carbonions

C. Carbonium ions

D. Free radicals

Answer: D

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111. The function of $AlCl_3$ in Friedel-Craft's reaction is:

A. To absorb water

B. To absorb HCl

C. To produce electrophile

D. To produce nucleophile

Answer: C

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112. Which one of the following does not show resonance ?

A. Carbon dioxide

B. Benzene

C. Nitromethane

D. Propane

Answer: D

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113. The strain in bonds of cyclopropane is:

A. $0^\circ 44'$

B. $24^\circ 44'$

C. $9^\circ 44'$

D. $5^\circ 16'$

Answer: B

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114. Which one of the following compound have zero dipole moment ?

A. p-dinitro benzene

B. p-dimethoxy benzene

C. 1-butene

D. 2-methyl-1-propene

Answer: A

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115. Which of the following can act as an nucleophile ?

A. BF_3

B. $FeCl_3$

C. $ZnCl_2$

D. C_2H_5MgBr

Answer: D

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116. Benzaldoxime exists in how many forms :

A. 1

B. 2

C. 3

D. 4

Answer: B

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117. Eclipsed and staggered forms of n-butane are called a pair of:

A. Diastereomers

B. Conformers

C. Isomers

D. Enantiomers

Answer: B

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118. Which one of the following compounds is most polar ?

A. CH_2I_2

B. CH_2F_2

C. CH_2Cl_2

D. CH_2Br_2

Answer: B

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119. The least energetic conformation of cyclohexane is:

A. Boat form

B. Half chair form

C. Chair form

D. Twisted form

Answer: C

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120. The fairly neutral character of CH_3OH is changed to which of the following by adding sodium metal:

A. Acidic

B. Neutral

C. An electrophile

D. A nucleophile

Answer: D

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121. During debromination of meso-dibromo-butane, the major compound formed is:

A. n-butane

B. 1-butene

C. Cis-2-butene

D. Trans-2-butene

Answer: D

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122. The numberof possible enantiomeric pairs that can be produced during monochlorination of 2-methyl butane is:

A. 2

B. 3

C. 4

D. 1

Answer: A

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123. The intermediate during the addition of HCl to propene is:

A. CH_3CHCH_2Cl

B. $CH_2\overset{+}{C}HCH_3$

C. $CH_3CH_2CH_2$

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

Answer: B

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124. Which of the following has zero dipole moment ?

A. Cis-but-2-ene

B. Trans-but-2-ene

C. But-1-ene

D. Trans-pent-2-ene

Answer: B

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125. The ratio of $\sigma \rightarrow \pi$ bonds is benzene is :

A. 2

B. 4

C. 6

D. 8

Answer: B

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126. A compound having n dissimilar asymmetric centres will have :

A. 2^n optical isomers

B. Zero

C. 2^{n+1} optical isomers

D. 2^{n-1} optical isomers

Answer: D

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127. Attacking species in S_E reactions for halogenation is:

A. Cl^-

B. Cl

C. $Cl^{\cdot}$

D. Cl^{+}

Answer: D

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128. An example of an electrophile is:

A. $AlCl_3$

B. Ammonia

C. Methanol

D. Water

Answer: A

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129. Which one is the seniormost functional group in the nomenclature of an organic compound if it possesses more than one functional group ?

A. -CHO

B. -COOH

C. -OH

D. $> \quad > CO$

Answer: B

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130. The arrangement of atoms that characterises a particular stereoisomer is called:

A. Geometry of isomer

B. Configuration

C. structural

D. None of the above

Answer: B

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131. The effect involving the complete transfer of a shared pair of electrons to one of the atoms joined by a multiple bond at the requirement of attacking reagent is called:

A. Inductive effect

B. Mesomeric effect

C. Electromeric effect

D. None of the above

Answer: C

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132. The number of asymmetric carbon atoms in a molecule of glucose is:

A. 6

B. 4

C. 5

D. 3

Answer: B

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133. Which group is always taken as substituent in IUPAC nomenclature of compound ?

A. $-NH_2$

B. -CN

C. $-NO_2$

D. -COOH

Answer: C

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134. The compound isomeric with acetone is:

A. Propanal

B. Propionic acid

C. Ethoxy ethane

D. None of the above

Answer: A

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135. The SN^2 mechanism for,

$R - X + KOH(aq) \rightarrow R - OH + KX$ follows with:

A. $100\ \%$ inversion

B. $50\ \%$ inversion

C. $40\ \%$ inversion

D. $30\ \%$ inversion

Answer: A

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136. Anti-Markownikoff addition of HBr is not observed in :

A. Propene

B. Butene-1

C. But-2-ene

D. Pent-2-ene

Answer: C

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137. Which of the following cannot show electromeric effect ?

A. Alkenes

B. Ketones

C. Aldehyde

D. Ethers

Answer: D

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138. Hydrogen cyanide and hydrogen isocyanide are:

A. fuctional isomers

B. Positional isomers

C. Metamers

D. Chain isomers

Answer: A

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139. Select the organic compounds which was prepared for the first time in laboratory from in elements:

A. Urea

B. CH_3COOH

C. C_2H_5OH

D. None of the above

Answer: B

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140. The shape of carbanion is:

A. Linear

B. Planar

C. Pyramidal

D. None of these

Answer: C

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141. The reagent used in dehydrohalogenation process is:

A. KOH alc.

B. Zn dust + alc.

C. Na

D. KOH(aq)

Answer: B

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142. The shape of carbanium ion is:

A. Planar

B. Linear

C. Pyramidal

D. None of these

Answer: A

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143. d-tartaric acid and l-tartaric acid are:

A. Structural isomers

B. Diastereoisomers

C. Tautomers

D. Enantiomers

Answer: D

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144. The hybridisation of carbon atoms in C-C single bond of $HC \equiv C - CH = CH_2$ IS:

A. $sp^3 - sp^3$

B. $sp^2 - sp^2$

C. $sp - sp^2$

D. $sp^3 - sp$

Answer: C

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145. The C-C bond length of the following molecules is in the order:

A. $C_2H_4 > C_2H_6 > C_2H_2$

B. $C_2H_2 > C_2H_4 > C_2H_6$

C. $C_2H_6 > C_2H_4 > C_2H_2$

D. none`

Answer: B

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146. The number of $1^\circ, 2^\circ$ and 3° carbon atoms present in isopentane are respectively:

A. 3,2,1

B. 2,3,1

C. 3,1,1

D. 2,2,1

Answer: C

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147. Reactivity of hydrogen atoms attached to different atoms in alkanes has the order:

A. $3^\circ > 1^\circ > 2^\circ$

B. $1^\circ > 2^\circ > 3^\circ$

C. $3^\circ > 2^\circ > 1^\circ$

D. None of these

Answer: C

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148. IUPAC name of urea is:

A. Diaminoketone

B. Aminoethanamide

C. Aminomethanamide

D. Aminoacetamide

Answer: C

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149. The total number of isomer possible for the formula C_4H_{10} is:

A. 3

B. 4

C. 2

D. 5

Answer: B

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150. Which type of strain is present in fully eclipsed conformation of butane ?

A. Angle strain

B. Steric strain

C. BOTH (A) AND (B)

D. Neither (A) nor (B)

Answer: C

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151. The correct IUPAC name of $(C_2H_5)_4C$ is :

A. Tetraethyl methane

B. 2-ethylpentane

C. 3,3-diethylpentane

D. None of the above

Answer: C

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152. How many optically active stereoisomers are possible for butane-2,3-idol:

A. 1

B. 2

C. 3

D. 4

Answer: B

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153. In the following groups,

$$\underset{\text{I}}{-\text{OAc}},\ \underset{\text{II}}{-\text{OMe}},\ \underset{\text{III}}{-\text{OSO}_2\text{Me}},\ \underset{\text{IV}}{-\text{OSO}_2\text{CF}_3}$$

the order of leaving group ability is:

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

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

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

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

Answer: B

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154. The compound abd C-C abd will exist in:

A. 3 forms

B. 4 forms

C. 5 forms

D. 2 forms

Answer: A

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155. The number of isomers for the compound with molecular formula $C_2BrClFI$ is:

A. 3

B. 4

C. 5

D. 6

Answer: D

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156. Geometrical isomerism is not shown by:

A. $CH_3CH_2C(CH_3) = C(CH_3)CH_2CH_3$

B. $C_2H_5CH = CHCH_2I$

C. $CH_2 = C(Cl)CH_3$

D. $CH_2 = CH_2$

Answer: C

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157. An optically active compound is:

A. 1-bromobutane

B. 2-bromobutane

C. 1-bromo-2-methyl propane

D. 2-bromo-2-methyl propane

Answer: B

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158. C_7H_7Cl has in all.....isomers:

A. 2

B. 5

C. 3

D. 4

Answer: D

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159. The number of geometrical isomers in case of a compound with the structure,

$CH_3 - CH = CH - CH = CH - C_2H_5$ are:

A. Four

B. Three

C. Two

D. Five

Answer: A

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160. n-propyl alcohol and isopropyl alcohol are:

A. Position isomerism

B. Chain isomerism

C. Tautomerism

D. Geometrical isomerism

Answer: A

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161. The maximum number of stereoisomers possible for 3-hydroxy-2-methyl butanoic acid is:

A. 1

B. 2

C. 3

D. 4

Answer: D

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162. Resonance arises due to the:

A. Migration of atoms

B. Migration of proton

C. Delocalisation of $\sigma -$ electron

D. Delocalisation of $\pi -$ electron

Answer: D

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163. The number of isomeric structure for C_3H_9N would be:

A. 4

B. 3

C. 2

D. 1

Answer: C

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164. Which one of the following is the stablest structure of cyclohexatriene ?

A. Chair form

B. Boat form

C. Half chair form

D. Planar form

Answer: D

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165. The order of reactivities of the following alkyl halides for a S_N^2 reactions is:

A. RF $>$ RCl $>$ RBr $>$ RI

B. RF $>$ RBr $>$ RCl $>$ RI

C. RCl $>$ RBr $>$ RF $>$ RI

D. RI $>$ RBr $>$ RCl $>$ RF

Answer: D

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166. In butane, which of the following form has the least stable ?

A. Gauche form

B. Eclipsed form

C. Full eclipsed form

D. Anti

Answer: C

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167. The structures that do not actually exist are called:

A. Tautomers

B. Conformational isomers

C. Canonical structures

D. Optical isomers

Answer: C

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168. Which of the following will have least hindered rotation about C-C bond ?

A. Ethane

B. Ethylene

C. Acetylene

D. Hexachloro ethane

Answer: A

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169. The strongest base and nucleophile among the following is:

A. NH_4^+

B. $:NH_3$

C. $:\bar{N}H_2$

D. $:\bar{O}H$

Answer: C

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170. The number of $\pi -$ electrons present in cyclobutasdienyl anion $(C_4H_4)^{2} -$ is:

A. 8

B. 6

C. 4

D. 2

Answer: B

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171. Removal of hydrogen atom is easier when it is attached to:

A. 1° carbon

B. 2° carbon

C. 3° carbon

D. Same in all

Answer: C

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172. Unpaired electron in CH_3 occupies:

A. sp-hybrid orbital

B. sp^3-hybrid orbital

C. p-orbital

D. sp^2-hybrid orbital

Answer: B

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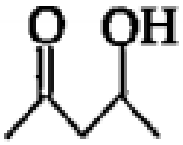
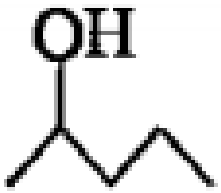
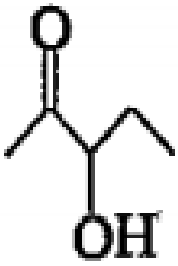
173. Which one of the following will most readily be dehydrated in acidic conditions ?

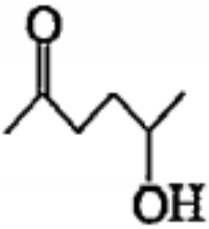
A. 



B.



C.



D.

Answer: A

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174. Dichloro ethylene shows:

A. Geometrical isomerism

B. Position isomerism

C. BOTH (A) AND (B)

D. None of these

Answer: C

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175. "The negative part of the addendum adds on the carbon atom joined to the least number of hydrogen

atoms." This statement is called:

A. Markownikoff's rule

B. Peroxide effect

C. Baeyer's strain theory

D. Thiele's theory

Answer: A

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176. The production of an optically active compound from a symmetric molecule without resolution is called :

A. Walden inversion

B. Partial racemisation

C. Asymmetric synthesis

D. Partial resolution

Answer: C

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177. Heterolysis of propane gives:

A. Methyl and ethyl free radicals

B. Methylium cation and ethyl anion

C. Methyl anion and ethylium cation

D. Methylium and ethylium cations

Answer: C

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178. Which one of the following is found in alkenes ?

A. Chain isomerism

B. Geometrical isomerism

C. Metamerism

D. Position isomerism

Answer: C

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179. The maximum number of positional isomers for an alkene with molecular formula C_4H_8 is:

A. 2

B. 3

C. 4

D. 5

Answer: C

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180. The process of separation of racemic mixture into d- and l-enantiomers is called:

A. Revolution

B. Resolution

C. Hydration

D. Dehydration

Answer: B

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181. In which of the following species the central carbon atom is negatively charged ?

A. Carbonium ion

B. Carbanion

C. Carbocation

D. Free radicals

Answer: B

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182. The number of different substitution products possible when ethane is allowed to react with bromine in sunlight are:

A. 9

B. 6

C. 8

D. 5

Answer: A

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183. Which of the following contains only three pairs of electrons ?

A. Carbocation

B. Carbanion

C. Free radical

D. None of these

Answer: A

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184. Which of the following is optically active?

A. Glycerin

B. Acetaldehyde

C. Glyceraldehyde

D. None of these

Answer: C

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185. Which group has the maximum -I effect ?

A. $-NO_2$

B. CN

C. $-COOH$

D. $-F$

Answer: A

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186. The isomeric cis-2-butene and trans-2-butene can be distinguished on the basis of:

A. Their optical properties

B. Their reduction products

C. The products they give on ozonlysis

D. The products they give on addition to bromine

Answer: D

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187. Zero inductive effect is shown by:

A. C_6H_5-

B. $-H$

C. CH_3-

D. $Cl-$

Answer: B

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188. How many optically active forms are possible for a compound of the formula,

A. 2

B. 4

C. 3

D. 8

Answer: D

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189. Total number of rotational conformers of n-butane are:

A. 2

B. 6

C. 5

D. 3

Answer: C

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190. Isomers which can be interconverted through rotation around a single bond are:

A. Conformers

B. Diastereoisomers

C. Enantiomers

D. Positional isomers

Answer: A

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191. Nitration of benzene is:

A. Nucleophilic substitution

B. Nucleophilic addition

C. Electrophilic substitution

D. Free radical addition

Answer: C

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192. In the nitration of benzene with a mixture of conc. HNO_3 and conc. H_2SO_4, the active species involved is:

A. Nitrite ion

B. Nitrate ion

C. Nitronium ion

D. Nitrogen dioxide

Answer: C

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193. Addition of HI on double bond of propene yields isopropyl iodide as major product. It is because the addition proceeds through:

A. More stable carbocation

B. More stable carbanion

C. More stable free radical

D. Homolysis

Answer: A

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194. IUPAC name of $(CH_3)_2N - C_2H_5$ IS:

A. Dimethyl ethyl amine

B. Dimethylaminomethane

C. Dimethylaminoethane

D. N,N-dimethylethanamine

Answer: D

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195. Which of the following IUPAC name is correct ?

A. 2-methyl-3-ethylpentane

B. 2-ethyl-3-methylpentane

C. 3-ethyl-2-methylpentane

D. 3-methyl-2-ethylpentane

Answer: C

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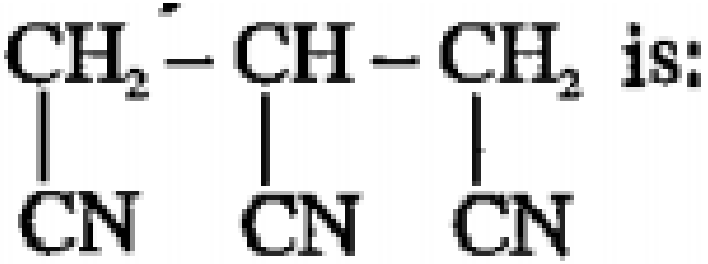
196. IUPAC name of the compound,



A. 1,2,3-tricyanopropane

B. 3-cyanopentane-1,5-dinitrile

C. 1,2,3-cyanopropane

D. Propane tricarbylamine

Answer: B

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197. IUPAC name of $CH_3CH_2CH(CH_3)NH_2$

A. 1-methyl propane-1-amine

B. Butan-2-amine

C. 2-methyl propan-3-amine

D. None of these

Answer: B

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198. The IUPAC name for,

$CH_3CHOHCH_2 - C(CH_3)_2 - OH$ is:

A. 1,1-dimethyl butane-1,2-diol

B. 2-methyl pentane-2-4-diol

C. 4-methyl pentane-2-4-diol

D. 1,3,3-trimethyl propane-1,3-diol

Answer: B

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199. IUPAC name of the compound,

A. But-2-en-1-ol

B. 1-hydroxy but-1-ene

C. 4-hydroxy butene-3

D. But-1-ene-1-ol

Answer: D

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200. Ammonia molecule is:

A. A nucleophile

B. An electrophile

C. A homolytic

D. An acid

Answer: A

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201. Among the following anions

$\bar{C}H_3$

$\bar{N}H_2$

OH^-

F^- , the order of basicity is:

A. agtbgtcgtd

B. bgtagtcgtd

C. cgtbgtagtd

D. cgtagtbgtd

Answer: A

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202. The bond between carbon atom (1) and carbon atom (2) in compound

$N \equiv C - CH = CH_2$ involves the hybrid is:

A. sp^2 and sp^2

B. sp^3 and sp

C. sp and sp^2

D. sp and sp

Answer: C

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203. Which of the following compounds will exhibit cis-trans isomerism ?

A. 2-butene

B. 2-butyne

C. 2-butanol

D. Butanal

Answer: A

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204. Which of the following has the highest nucleophilicity ?

A. F^-

B. OH^-

C. CH_3^-

D. NH_2^-

Answer: C

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205. Optical isomerism arises due to the presence of:

A. An asymmetric carbon atom

B. A centre of symmetry

C. A line of symmetry

D. A plane of symmetry

Answer: A

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206. write functional isomers for $C_4H_{10}O$.

A. 5

B. 7

C. 2

D. 4

Answer: B

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207. The total number of optically active isomers for $CH_2OH(CHOH)_3CHO$ are:

A. 16

B. 8

C. 4

D. 2

Answer: B

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208. The first organic compound was synthesized in a chemical laboratory was:

A. Methane

B. Chloroform

C. Sucrose

D. Urea

Answer: D

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209. The C-H bond distance is the longest in:

A. C_2H_2

B. C_2H_4

C. C_2H_6

D. $C_2H_2Br_2$

Answer: C

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210. The IUPAC name of the compound,

$CH_3 - CH(CH_3) - CH_2OH$ is:

A. 1-pentanol

B. Pentanol

C. 2-methyl propan-1-ol

D. 3-methyl butan-1-ol

Answer: D

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211. IUPAC name of $(CH_3)_3C - CH = CH_2$ is:

A. 3,3,3-trimethyl prop-1-ene

B. 1,1,1-trimethyl but-2-ene

C. 3,3-dimethyl but-1-ene

D. 2,2-dimethyl but-3-ene

Answer: C

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212. IUPAC name of $CH_2 = CH - CH(CH_3)_2$ is:

A. 1,1-dimethyl prop-2-ene

B. 3-methyl but-1-ene

C. 2-vinylpropane

D. 1-isopropyl ethylene

Answer: B

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213. IUPAC name of the compound,

$(CH_3)_3C - CH_2 - CHO$ is:

A. 3,3,3-trimethylpropanal

B. 1,1,1-trimethylpropanal

C. 3,3-dimethylbutanal

D. 1,1-dimethylbutanal

Answer: C

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214. The hybridisation of carbon in diamond graphite and acetylene is in the order:

A. sp^3, sp^2, sp

B. sp^2, sp^3, sp

C. sp, sp^2, sp^3

D. sp^2, sp, sp^3

Answer: A

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215. Homolytic fission of C-C bond in ethane gives an intermediate in which carbon is....hybridised:

A. sp^3

B. sp^2

C. sp

D. sp^2d

Answer: A

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216. Which does not decolourise bromine water ?

A. 2-butene

B. benzene

C. 1-butene

D. 1-propyne

Answer: B

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217. Shifting of electrons of a multiple bond under the influence of a reagent is called:

A. I-effect

B. E-effect

C. M-effect

D. T-effect

Answer: B

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218. The number of electrons in the valency shell of carbon in methyl carbonium ion is:

A. 4

B. 6

C. 7

D. 8

Answer: B

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219. Isomerism among compounds due to the migration of a proton is known as:

A. Geometrical

B. chain

C. Tautomerism

D. Position

Answer: C

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220. Isomerism exhibited by acetic acid and methyl formate is:

A. Functional

B. Chain

C. Geometrical

D. Optical

Answer: A

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221. An alkene is most likely to react with:

A. A free radical

B. An alkali

C. An electrophile

D. A nucleophile

Answer: C

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222. Vital force theory of the origin of organic compounds was discarded by:

A. Kolbe's synthesis

B. Haber's synthesis

C. Wohler's synthesis

D. Berthelot's synthesis

Answer: C

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223. The IUPAC name of the compound, $CH_3 - CH_2 - CH(CH_3) - CONH_2$ is:

A. 2-ethylbutanamide

B. 2-methylbutanamide

C. 1-amino-2-methylpropane

D. None of the above

Answer: B

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224. In E_2 elimination, some compounds follow Hofmann's rule which means:

A. The double bond goes to the most substituted carbon

B. The compound is resistant to elimination

C. No double bond is formed

D. The double bond goes mainly toward the least substituted carbon

Answer: D

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225. Stereoisomers (Geometrical or opticals) which are neither superimposable nor mirror image to each other are called:

A. Enantiomers

B. Mesomers

C. Tautomers

D. Diastereomers

Answer: D

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226. The hydrolysis of alkyl halides by aqueous NaOH is best termed as:

A. Electrophilic substitution reaction

B. Electrophilic addition reaction

C. Nucleophilic addition reaction

D. Nucleophilic substitution reaction

Answer: D

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227. The IUPAC name for,

$(CH_3)_2CH - CH_2 - CH_2 - Cl$ is:

A. 1-chloropentane

B. Isopentyl chloride

C. 2-methyl-4-chlorobutane

D. 1-chloro-3-methylbutane

Answer: D

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228. The most stable carbonium ion is:

A. Methyl carbonium ion

B. Primary carbonium ion

C. Secondary carbonium ion

D. Tertiary carbonium ion

Answer: D

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229. Fischer projection indicates:

A. Horizontal substituents above the plane

B. Vertical substituents above the plane

C. Both horizontal and vertical substituents

D. Both horizontal and vertical substituents above the plane

Answer: A

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230. Rotation of plane polarized light can be measured by:

A. Manometer

B. Calorimeter

C. Polarimreter

D. Viscometer

Answer: C

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231. IUPAC name of $(C_2H_5)_2CHCH_2OH$ is:

A. 2-ethylbutan-1-ol

B. 2-methylpentan-1-ol

C. 2-ethylpentan-1-ol

D. 3-ethylbutan-1-ol

Answer: A

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232. The IUPAC name of the compound,

$CH_2 = C(CH_3) - CH_2 - C \equiv CH$ is:

A. 2-methylpent-1-en-4-yne

B. 2-methylpent-1-en-4-yne

C. 2-methylpent-2-en-4-yne

D. 4-methylpent-4-en-1-yne

Answer: A

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233. The number of $\pi -$ bonds present in propyne is:

A. 2

B. 3

C. 1

D. 4

Answer: A

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234. The molecular formula of a saturated compound is $C_2H_4Br_2$. This formula permits the existence of:

A. Functional isomers

B. Optical isomers

C. Positional isomers

D. Cis-trans isomers

Answer: C

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235. The isomerism exhibited by n-butyl alcohol and isobutyl alcohol is:

A. Metamerism

B. Positional

C. Functional

D. Chain

Answer: D

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236. Addition of Br_2 on trans-butene-2 gives:

A. A racemic mixture of 2,3-dibromo butane

B. Meso form of 2,3-dibromobutane

C. Dextro form of 2,3-dibromobutane

D. Laevo form of 2,3-dibromobutane

Answer: B

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237. Compound having same molecular formula but different properties are called:

A. Isotopes

B. Isobars

C. Isomers

D. Isochores

Answer: C

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238. The IUPAC name of the compound having the formula $Cl_3C.CHO$ is:

A. Chloral

B. Trichloracetaldehyde

C. 1,1,1-trichloroethanal

D. 2,2,2-trichloroethanal

Answer: D

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239. Meso tartaric acid is optically inactive due to the presence of:

A. Molecular symmetry

B. Molecular asymmetry

C. External compensation

D. Two asymmetric carbon atoms

Answer: A

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240. The arrangement of decreasing order of stability of 'CH_3', 'C_2H_5', '(CH_3)_2CH' and '(CH_3)_3C` free radicals is:

A. $\dot{C}H_3 > \dot{C}_2H_5 > (CH_3)_2CH > (CH_3)_3$

B. $(CH_3)_3\dot{C} > (CH_3)_2\dot{C}H > \dot{C}_2H_5 > \dot{C}\dot{H}_3$

C. $\dot{C}_2H_5 > \dot{C}H_3 > (CH_3)_2\dot{C}H > (CH_3)_3\dot{C}$

D. $(CH_3)_3\dot{C} > (CH_3)_2\dot{C}H > \dot{C}H_3 > \dot{C}_2H_5$

Answer: B

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241. In ethylene angle CCH is:

A. 180°

B. 120°

C. 109°

D. 90°

Answer: B

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242. Which of the following compounds can exist in optically active form ?

A. 1-butanol

B. 2-butanol

C. 3-pentanol

D. 4-heptanol

Answer: B

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243. The stability of 2,3-dimethyl but-2-ene is more than 2-butene. This can be explained in terms of:

A. Resonance

B. Hyper conjugation

C. Electromeric effect

D. Inductive effect

Answer: B

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244. Who pointed out the concept of hyper conjugation ?

A. Nathan and Baker

B. Mullikan

C. Kekule

D. Kolbe

Answer: A

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245. For all practical purposes, influence of inductive effect is neglected after:

A. Second carbon atom

B. First carbon atom

C. Third carbon atom

D. None of the above

Answer: A

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246. Sometimes the behaviour of a compound is explained by assuming that it exists in a world between two or more different possible structures. The phenomenon is called:

A. Isomerism

B. Resonance

C. rotation

D. Allotropism

Answer: B

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247. Carbanions initiate:

A. Addition reactions

B. Substitution reactions

C. BOTH (A) AND (B)

D. None of these

Answer: C

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248. Select the most reactive cycloalkane:

A. Cyclopropane

B. Cyclobutane

C. Cyclopentane

D. Cyclohexane

Answer: A

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249. The homolytic fission of a hydrocarbon results in the formation of:

A. Carbonium ion

B. Free radical

C. Carbanions

D. Carbenes

Answer: B

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250. Hybridisation involves:

A. Addition of electron pair

B. Mixing of atomic orbitals

C. Removal of electrons

D. Separation of orbitals

Answer: B

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251. In which case the carbon-carbon bond length is same ?

A. 2-butene

B. benzene

C. 1-butene

D. 1-propyne

Answer: B

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252. Which species among the following is neither a nucleophile nor an electrophile:

A. $\bar{X}$

B. $\overset{+}{N}O_2$

C. NH_3

D. $\overset{+}{N}H_4$

Answer: D

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253. The overlapping in benzene involves:

A. sp-p

B. sp-sp

C. sp^2 - sp^2

D. sp^3 - sp^3

Answer: C

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254. Which hybrid orbitals will form the compound, CH_4

A. sp^2 and sp^3

B. only sp^3

C. sp and sp^3

D. sp and sp^2

Answer: A

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255. Homolytic and heterolytic bond dissociation energies are

A. Same

B. Equal

C. Different

D. None of these

Answer: C

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256. The compound in which C uses its sp^3-hybrid orbitals for bond formation is:

A. $H\overset{\times}{C}OOH$

B. $(H_3C)_2\overset{\times}{C}O$

C. $(CH_3)_3\overset{\times}{C}OH$

D. $CH_3\overset{\times}{C}HO$

Answer: C

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257. An alkane forms isomers if the number of carbon atoms is:

A. ge 1

B. ge 2

C. ge 3

D. ge 4

Answer: D

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258. Which of the following is optically active?

A. n-propanol

B. 2-chlorobutane

C. n-butanol

D. 3-hydroxyoentane

Answer: B

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259. The carbon-carbon length is saturated, aliphatic compound is:

A. 1.33 $\overset{\circ}{A}$

B. 1.54 $\overset{\circ}{A}$

C. 1.39$\overset{\circ}{A}$

D. 1.45 $\overset{\circ}{A}$

Answer: B

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260. Which of the following structures permits cis-trans isomerism ?

A. $X_2C = CY_2$

B. $XYC = CZ_2$

C. $X_2C = CXY$

D. XYC=CXZ

Answer: D

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261. A compound contains 2 dissimilar asymmetric carbon atoms. The number of optically active isomers is:

A. 2

B. 3

C. 4

D. 5

Answer: C

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262. Isomerism exhibited by acetic acid and methyl formate is:

A. Functional

B. Chain

C. Geometrical

D. Central

Answer: A

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