o1. Hydrocarbons containing only single bonds between the carbon atoms are called .....
A. Alkenes B. Alkynes C. Aromatics D. **Alkanes** E. Ketones

2. Empirical formula expresses the actual number of mole of each element in a molecule
A. True **B. False**

3. Empirical formula expresses the ratio of the number of mole of atoms of elements in a molecule of a compound.
A. **True** B. False

4. A hydrocarbon with vapour density 28 contain 85.7 % carbon and 14.3 % hydrogen. Deduce the empirical formula of the compound
A. CH_2 B. C_2H_4 C. C_3H_6 D**. C_4H_8** E. C_5H_{10}

5. Isomerism is a phenomenon whereby two or more compounds have different molecular formula.
A. True B**. False**

6. The following are types of isomerism except
A. Structural isomerism B. Geometric isomerism
C. Optical isomerism D. **Homologous isomerism**

7. A homologous series is a family of organic compounds in which successive members differ in their molecular formulae by one CH_4 group
A. True B**. False**

8. The following are characteristics of a homologous series except
A. The member conforms to general molecular formula
B. There is a gradual change in the physical properties of the member as relative molecular mass increases
C**. The members are prepared by using different general methods**
D. The members show similar chemical properties

9. Saturated hydrocarbons contain only carbon-carbon single bonds
A. **True** B. False

10. Unsaturated hydrocarbons contain only carbon-carbon single bonds
A**. False** B. True

11. All cycloalkanes have..... general formula
A**. C_nH_{2n}** B. C_nH_{2n+2} C. CnH_{2n-2} D. C_nH_n E. $C_{2n}H_{2n}$

12. All alkanes have..... general formula
A. $C_{2n}H_{2n}$ B. C_nH_n C**. C_nH_{2n+2}** D. C_nH_{2n-2} E. C_nH_{2n}

13. An organic compound contains 79 % of carbon and 21% of hydrogen by mass. if $1dm^3$ of the compound weighs 1.30g, find its empirical formula.
A. CH_5 B. CH_4 C. CH_2 D. CH E. **CH_3**

14. An organic compound contains 60 % of carbon, 13.3 % hydrogen and 26.7 % oxygen by mass. Find its empirical formula.
A**. C_3H_8O** B. C_4H_7O C. CHO
D. C_2H_4O E. $C_3H_8O_3$

15. An organic compound contains 50% of carbon 20% hydrogen and 30% oxygen by mass. find its empirical formula.
A. **$C_2H_{10}O$** B. C_2H_3O C. $C_6H_{10}O$
D. C_2H_9O E. $C_2H_{10}O_3$

16. An organic compound contains 69% of carbon and 31% of hydrogen by mass. find its empirical formula.
A**. CH_5** B. C_4H_5 C. CH_4CH_5 D. CH_7 E. C_5H_5

17. An organic compound contains 40% of carbon, 21% of hydrogen and 39% by mass. find its empirical formula.
A. CH_9O_4 B**. CH_9O** C. CH_4O
D. CH_9O_2 E. C_3H_9O

18. An organic compound contains 30% of carbon, 25% hydrogen and 45% oxygen by mass. Find its empirical formula
A. CH_5O B. $C_3H_{10}O$ C. $CH_{10}O_2$
D**. $CH_{10}O$** E. $CH_{10}O_4$

19. Hydrocarbons containing only single bonds between the carbon atoms are called…….
A. Alkenes B. Aromatics C. Ketones
D. Alkynes E. **Alkanes**

20. What general class of compounds is also known as olefins?

A. **Alkenes** B. Aromatics C. Alkanes
D. Alkynes E. Ketones

21. Hydrocarbons containing carbon-carbon triple bonds are called ……..
A. Alkanes B. Aromatic hydrocarbons
C. **Alkynes** D. Alkenes E. Olefins

22. Alkynes always contain a ……
A. carbon-carbon single bonds
B. carbon-carbon double bonds
C**. carbon-carbon triple bonds**
D. carbon-carbon triple and double bonds
E. All of the above

23. Alkenes always contain a ……..
A. carbon-carbon single bond
B. **carbon-carbon double bonds**
C. carbon-carbon triple bonds

24. Hybridization of the carbon-carbon double bonds is……..
A. sp B**.** $\mathbf{sp^2}$ C. sp^3 D. sp^4 E. sp^5

25. Hybridization of the carbon-carbon triple bonds is……
A**. sp** B. sp^2 C. sp^3 D. sp^4 E. sp^5

26. The molecular geometry of each carbon atom in an alkane is.....
A. Octahedral B. Trigonal pyramidal
C. Square planar D**. Tetrahedral**
E. Trigonal planar. sp

Tetrahed

27. The minimum number of carbons necessary for a hydrocarbon to form a branched structure is……
A. 1 B. 2 C. 3 D**. 4** E. 5

28. Cyclohexane has …….. fewer hydrogens than n-hexane
A. 1 B**. 2** C. 3 D. 4 E. 5

29. How many structural isomers of butane exist?
A. 1 B**. 2** C. 3 D. 4 E. 5

30. How many structural isomers of pentane exist?
A. 1 B. 2 C. **3** D. 4 E. 5

31. How many structural isomers of methane exist?
A. 0 B**. 1** C. 2 D. 3 E. 4

32. How many structural isomers of propane exist?
A. 0 B**. 1** C. 2 D. 3 E. 4

33. Aromatic rings contain a total of (4n + 2) non delocalized pi electrons.
A. **True** B. False

34. The general formula of an alkene is .....
A**.** $\mathbf{C_nH_{2n}}$ B. $C_{2n}H_{2n}$ C. C_nH_n
D. C_nH_{2n+2} E. C_nH_{2n-2}

35. The general formula of cycloalkane is.....
A. $\mathbf{C_nH_{2n}}$ B. $C_{2n}H_{2n}$ C. C_nH_n
D. C_nH_{2n+2} E. C_nH_{2n-2}

36. The name of CH_3-CH_2CH_2=CH_2 is .....
A. But-1-yne B. But-1-ane C**. But-1-ene**
D. But-1-enol E. Butane-1-ene

37. How many structural isomers of hexane exist?
A. 1 B. 2 C. 3 D. 4 E**. 5**

38. The name of CH_3-CH_2=CH_2-CH_3 is .....
A. But-1-ene B**. But-2-ene** C. But-3-ene
D. But-4-ene E. But-5-ene

39. The name of CH_3-CH_2=CH_2-CH_2-CH_2-CH_3 is …….
A. Hex-1-ene B**. Hex-2-ene** C. Hex-3-ene
D. Hex-4-ene E. Hex-5-ene

40. Cycloalkanes are alkanes that contain a ring of three or more carbon
A. **True** B. False

41. The IUPAC name of CH_2=C=CH_2 is .....
A. Propan-1, 1- diene B. **Propan-1, 2- diene**
C. Propan-1, 3- diene D. Propan-1, 4- diene
E. Propan-1, 5- diene

42. The IUPAC name of CH_2=CH-CH=CH-CH_3
A. penta-1, 1-diene B. penta-1, 2-diene
C**. penta-1, 3-diene** D. penta-1, 4-diene
E. penta-1, 5-diene

43. The IUPAC name of CH_3-CH=C=CH-CH_3 is .....
A. penta-1, 1-diene B. penta-1, 3-diene
C. penta-2, 1-diene D**. penta-2, 3-diene**
E. penta-2, 4-diene

44. The IUPAC name of CH_3-CH_2-CH=CH

A**. But-1-ene** B. But-2-ene
C. But-3-ene D. But-4-ene
E. But-5-ene

45. The IUPAC name of $CH_2=CH-CH=CH=CH_2$
A. Penta-1, 3, 4-triene B**. Penta-1, 2, 4-triene**
C. Penta-2, 4, 5-triene D. Penta-1, 3, 5-triene
E. Penta-1, 4, 6-triene

46. The IUPAC name of $CH_2=C=C=CH_2$
A**. But-1, 2, 3-triene** B. But-2, 2, 3-triene
C. But-1, 5, 3-triene D. But-1, 2, 4-triene
E. But-4, 2, 3-triene

47. In naming an organic compound the longest continuous chain containing the functional group (double or triple bonds) is numbered in a direction that gives the functional group the lowest possible number.
A**. True** B. False

48. In naming of organic compounds a chain that has more than one substituents are not cited in alphabetical order.
A. True B**. False**

49. If counting in either direction results in the same number for the alkane functional group, the correct name is the one containing the lowest substituent number.
A. **True** B. False

50. When ethyne is bubbled into bromine water in a test tube a colorless liquid result. The reaction which occurred is .....
A**. Addition reaction** B. Substitution reaction
C. Decomposition reaction D. Hydrogenation reaction E. Polymerization reaction

51. Alkynes have the general formula CH_{2n-2} when hydrogenated with 2 moles of hydrogen, they produce compounds with general formula
A. **C_nH_{2n}** B. C_nH_{2n-2} C. C_nH_{2n+2}
D. C_nH_{2n+1} E. C_nH_{2n-1}

52. Three different hydrocarbons A, B, C were passed into three separate test tube containing acidified $KMnO_4$. A and B decolorized the acidified $KMnO_4$ which C showed no visible reaction. A and B must be
A. **Unsaturated Hydrocarbon** B. Saturated Hydrocarbon C. Alkanes D. Cycloalkanes
E. Butane

53. Alkenes and Alkynes react the same with the following except.....
A. Acidified $KMnO_4$ solution B. Bromine water
C. **Ammoniacal $AgNO_3$ solution**

54. C_2H_6 cannot undergo .....
A. substitution reaction
B. **Addition reaction**

55. Internal alkynes are alkynes with triple bonds located elsewhere along the chain
A**. True** B. False

56. Terminal alkynes are alkynes with triple bonds located elsewhere along the chain
A. True B**. False**

57. Terminal alkynes are alkynes with triple bonds located at the end of the chain
A. **True** B. False

58. What is the Bond angle of methane .....
A. **109.5** B. 106.5 C. 209.5
D. 129.5 E. 119.5

59. A primary carbon atom is one which is bonded to only one other carbon atom
A. **True** B. False

60. A secondary carbon atom is one which is bonded directly to two other carbon atoms
A. **True** B. False

61. A tertiary carbon atom is one which is bonded directly to three other carbon atoms
A. **True** B. False

62. Complete the combustion reaction
$CH_4 + 2O_2 = X + 2H_2O$
A**.** CO B. **CO_2** C. CO_3 D. $2CO_2$ E. $3CO_2$

63. The reaction of alkanes with halogens is an

addition reaction
A. True B. **False**

64. Complete the reaction $CH_3Cl + Cl_2 \rightarrow ? + HCl$ in presence of ultraviolent light
A. CH_2Cl_3 B. CH_3Cl_3 C. CH_2Cl_4
D. $CHCl_2$ E. **CH_2Cl_2**

65. Complete the reaction $CH_4 + Cl_2 \rightarrow CH_3Cl + ?$ in presence of ultraviolent light
A**. HCl** B. 2HCl C. 3HCl D. 4HCl E. 5HCl

66. Complete the reaction $ROH + ? \rightarrow RCl + HCl + POCl_3$
A. PCl B. PCl2 C. PCl_3 D. PCl_4 E**. PCl_5**

67. Complete the reaction $CH_2Cl_2 + Cl_2 \rightarrow CH_2Cl_3 + ?$ in presence of ultraviolent light
A. CH_2Cl_3 B. $2CH_2Cl_2$ C. CH_2Cl_2
D. **HCl** E 2HCl

68. Complete the reaction $? + Cl_2 \rightarrow CH_2Cl_2 + HCl$ in presence of ultraviolent light
A**. CH_3Cl** B. CH_2Cl_2 C. $CH_2Cl_2 + HCl$
D. CH_1Cl_3 E. CH_2Cl_3

69. Complete the reaction $? + Cl_2 \rightarrow CCl_4 + HCl$ in presence of ultraviolent light
A. CH_2Cl_3 B. CH_3Cl C. CH_3Cl_2
D. **$CHCl_3$** E. CH_2Cl_2

70. Complete the reaction $CHCl_3 + Cl_2 \rightarrow ? + HCl$ in presence of ultraviolent light
A. **CH_2Cl_2** B. $CHCl_3$ C. CCl_4
D. CH_2Cl_4 E. CH_3Cl_2

71. A sigma bond is stronger than a pie bond
A. **True** B. False

72. There is restriction of rotation about the multiple bonds as against free rotation about single bonds.
A. True B**. False**

73. Carbon - carbon bond have bond angle at 130^0 to each other leading to a planar structure
A. True B**. False**

74. Carbon - carbon bond have bond angle at 109.5^o to each other leading to a linear structure
A. True B**. False**

75. Geometric isomers are different compounds which have the same structure but different arrangement of their atoms in space.
A. **True** B. False

76. For an alkene to show geometric isomerism, each carbon of the double bond have two different atoms or groups attached to it.
A. **True** B. False

77. ..... could be the formula of an alkene.
A. C_3H_8
B**. C_3H_6**
C. C_6H_6

78. In general, ... are the most reactive hydrocarbons.
A. Alkenes B. **Alkynes** C. Alkanes
D. Cycloalkanes E. Olefins

79. The addition of HBr to 2-butene produces .....
A. 1-bromobutane B. **2-bromobutane**
C. 1,2-dibromobutane D. 2,3-dibromobutane
E. No reaction

80. ..... is the reagents necessary to yield the product of the reaction $CH_2=CH_2 \rightarrow$ Ethane
A. **H_2/Pt** B. $2H_2/Pt$ C. H_4/Pt
D. $H_2/Pt/Ag$ E. $3H_2/Pt$

81. ..... is the reagents necessary to yield the product of the reaction $CH_2=CH_2 \rightarrow$ Chloroethane
A. 3HCl B. H_2Cl C. HCl_2
D. 2HCl E**. HCl**

82. Like alkanes, alkenes and alkynes undergo combustion reactions
A**. True** B. False

83. Alkenes and alkynes also undergo addition reactions
A. **True** B. False

84. An addition reaction is a reaction in which the atoms from one molecule are added to another molecule to form a single molecule
A. **True** B. False

85. Hydrogenation of an alkene requires high temperatures and a catalyst such as
A. **Ni** B. Na C. Ng D. Mg E. Ca

86. The addition of HBr to 2-Butene produces.....
A. 1-bromobutane B. **2-bromobutane**
C. 1, 2-bromobutane D. 2, 3-bromobutane
E. No reaction

87. The addition of Br_2 to ethene produces .....
A. 1, 1-dibromoethane B. **1, 2 - dibromoethane**
C. 2, 2-dibromoethane D. 2, 3 - dibromoethane
E. No reaction

88. The addition of Br_2 to ethyne produces .....
A**. 1,2 – dibromoethene** B. 1,2 - dibromoethane
C. 1,2 – dibromoethyne D. 2,2 - dibromoethene
E. 1,1 – dibromoethane

89. What is the product of $H_2C=CH_2 + O_3 \rightarrow$
A. $H_2C=O$ B. $H_2C=O + H_2C=CH_2$ C. $3H_2C=O$
D**. $H_2C=O + H_2C=O$** E. No reaction

90. An alkynes react with one mole of hydrogen to give .....
A. Alkanes B. Alkanones C. Saturated hydrocarbon D**. Unsaturated hydrocarbon**
E. No reaction

91. Which one of the following could be a cyclic alkane .....
A. C_5H_5 B**. C_3H_6** C. C_4H_6 D. C_2H_6 E. C_9H_{20}

92. The reaction of Ag_2NO_3 with a sample yield a white precipitate. This reaction is only possible with .....
A. Alkanes B. Alkenes C. Alkynes
D. Internal Alkynes E. **Terminal Alkynes**

93. What is the product of addition of Ag_2NO_3 to alkene is.....
A. Saturated hydrocarbons B. Unsaturated hydrocarbon C**. No reaction**

94. What is the product of addition of Ag_2NO_3 to alkane is.....
A. Alkenes B. Alkanes C. Alkanal
D. Alkanone E. **No reaction**

95. What is the product of addition of Ag_2NO_3 to ethene is.....
A. Ethane B. Ethene C. Ethyne
D. Butane E. **No reaction**

96. What is the product of addition of Ag_2NO_3 to Propane is.....
A. 1,2 – Propan B. 1- propane C. 3,2-propaene
D. 1, 3- propane E. **No reaction**

97. What is the product of addition of Ag_2NO_3 to 1,2, - dimethyl Propane is .....
A. 2, propane B. 1, 3 – propane C. propene
D. 1, 3, 4 – butane E. **No reaction**

98. What is the product of addition of Ag_2NO_3 to Propene is.....
A. Propane B. 1,2 – propanol C. Butanol
D. Propanal E. **No reaction**

99. The reaction between unsaturated hydrocarbons and water in presence of acid is called?
A. **Acid - catalyzed reaction**
B. Water - catalyzed reaction
C. Based - catalyzed reaction
D. Acid, based - catalyzed reaction
E. Hydrogenation - catalyzed reaction

100. What is the product of $CH_3-CH_2-CH=CH_2 + HCl$
A. Chlorobutane B. 1 - Chlorobutane
C. **2 – Chlorobutane** D. 3 - Chlorobutane
E. 4 – Chlorobutane

101, What is the product of $CH_3-CH_2-CH= + H_2$ -> in the presence of a catalyst
A. 1, 2 – butane B. 1- butane
C. 2- butane D. propane
E. **Butane**

102. What is the product of $CH_3-CH2-CH=CH2 + HBr$
A. Bromobutane B. 1- bromobutane
C**. 2-bromobutane** D. butane
E. No reaction

103. Addition of hydrogen to an alkene is called?
A. Base-Catalytic hydrogenation

B. Base- Catalytic reaction
C. Acid-Catalytic hydrogenation
D. **Catalytic hydrogenation**
E No reaction

104. What is the product of CH_3-CH_2-CH=CH_2 + H_2O
A. Butane B. 2-Butane C. **Butanol**
D. Butene E. No reaction

105. Fluorine is not always used in the addition reaction of unsaturated hydrocarbons because the reaction with fluorine is?
A. slow B. Fast C. **Explosive** D. No reaction

106. Complete the reaction CH_4 + ?→ CO_2 + $2H_2O$
A. O B. 2O C. O_2 D. **$2O_2$** E. $3O_2$

107. Complete the reaction $2CH_4$ + ? → $2CO_2$ + $4H_2O$
A. O B. 2O C. $2O_2$ D**. $4O_2$** E. $CHCO_2$ + $2H_2O$

108. Complete the reaction CH_4 + $2O_2$ → CO_2 + ?
A. H_2O B. H_2 C. $2H_3O$
D. **$2H_2O$** E. No reaction

109. The addition of bromine solution can be used as qualitative test for the presence of unsaturation
A. **True** B. False

110. Markonikovs rule state that the more electropositive part of the reagent should go to carbon bond that has the lesser number of hydrogen atoms
A. True B. **False**

111. The members of homologous series conform to a different general molecular formula
A. True B. **False**

112. The members of homologous series change gradually in their physical properties as the relative molecular mass increases
A. **True** B. False

113. The members of homologous series are prepared using the same general methods
A. **True** B. False

114. The members of homologous series show similar chemical properties
A. **True** B. False

115. The boiling and melting points of straight chain hydrocarbon increases with increasing molar mass
A. **True** B. False

116. The branch chain isomers boil at lower temperatures than the isomeric straight chain
A. **True** B. False

117. The greater the degree of branching in isomer, the lower its boing point
A. **True** B. False

118. For the following chemical reaction C_xH_y+ $5O_2$ → $3CO_2$ + $4H_2O$. What is C_xH_y ?
A. Ethene B. Ethane C. Propene
D**. Propane** E. Butane

119. The formula for chlorobenzene is .....
A. C_6H_6Cl B**. C_6H_5Cl**
C. C_6ClH_6 D. C_6ClH_5

120. Addition of HI to cyclohexene will give.....
A. Cyclohexene B. Iodohexene
C. Iodocyclohexene D. **Iodocyclohexane**
E. Iodocyclohexyne

121. Addition of HCl to cyclobutene will give.....
A. Butene B. Clorobutane
C. Clorocyclobutene D. **Clorocyclobutane**
E. No reaction

122. Addition of HBr to cyclohexene will give.....
A. cyclohexene B. Bromocyclohexene
C. **Bromocyclohexane** D. 2-Bromocyclohexene
E Bromocyclohexyne

123. Addition of H_2 to cyclohexene in presence of Ni as a catalyst will give.....
A. Hexene B. Cyclohexene
C. **Cyclohexane** D. Cyclohexyne
E. No reaction

124. Addition of H_2 to propyne in presence of Ni as a catalyst will give.....
A. Propane B **Propene** C. Propyne
D. 2-Propane E. No reaction

125. What is the product of addition of $CH_3CH_2=CH_2$ + HBr→
A. 2- propane B. 1- bromopropane
C. **2- bromopropane** D. 1,2 - dibromopropane
E. 1,2- bromopropane

126. What is the major product of the reaction between 2-methyl-2-butene and HI
A. 2-iodo-3-methylbutane
B. 3-iodo-2-methylbutane
C**. 2- iodo-2-methylbutane**
D. 2-methylbutene
E. No reaction

127. 1-bromo-5-methylhex-3-yne is as example of terminal alkyne.....
A. True B. **False**

128. 1-bromo-5-methylhex-3-yne is as example of internal alkyne.....
A**. True** B. False

129. 3-iodo-2-chlorooct-4-yne is an example of internal alkyne
A**. True** B. False

130. 3-iodo-2-chlorooct-4-yne is an example of terminal alkyne
A. **True** B. False

131. 3-iodo-2-chlorooct-1-yne is an example of terminal alkyne
A. **True** B. False

132. But-1-yne is an example of terminal alkyne
A. True B**. False**

133. Terminal alkynes are less reactive than internal alkynes toward the addition of water
A. **True** B. False

134. What is the major product of reaction between hex-3-yne with excess HBr.....
A. 2-dibromohexene B. 3-dibromohexene
C. Dibromohexene D. **3, 3 -dibromohexane**
E. No reaction

135. There is free rotation around carbon-carbon single bond
A**. True** B. False

136. There is free rotation around carbon-carbon triple bonds
A. True B**. False**

137. The rotation around a carbon-carbon double bond is considerably restricted
A**. True** B False

138. What is the product of the chemical reaction $CH_3Cl + Cl_2$→ ? in the presence of sun light
A. $CH_4 + HCl$ B. $CH_3Cl + HCl$
C. **$CH_2Cl_2 + HCl$** D. $CH_4 + HCl + H_2O$
E. $CH_3 + HCl$

139. The general formula for the combustion of alkane is.....
A. $C_xH_x + (x + y/4)O_2 \rightarrow xCO_2 + (y/2)\ H_2O$
B. $C_xH_y + (x + y/2)O_2 \rightarrow xCO_2 + (y/2)\ H_2O$
C. $C_xH_y + (x + y/4)O_2 \rightarrow yCO_2 + (y/2)\ H_2O$
D. $C_xH_y + (x + y/4)O_2 \rightarrow xCO_2 + (y/4)\ H_2O$
E. **$C_xH_y + (x + y/4)O_2 \rightarrow xCO_2 + (y/2)\ H_2O$**

140. Determine the molecular formula of an open chain alkane with vapour density 29
A. C_2H_6 B. CH_4 C. C_3H_4 D**. C_4H_{10}** E. C_5H_{12}

141. Which of the following is not a metal catalyst for the hydrogenation of an alkene?
A. Pd B. Pt C. Ni D**. Na**

142. An alkene absorbs one mole of hydrogen in the presence of a catalyst to give 3, 4-dimethylhexane. What is the name of the alkene
A. 2, 3-dimethylhex-3-ene
B. 3, 3-dimethylhex-3-ene
C. 3, 3-dimethylhexane
D. 3, 4-dimethylhexane
E. **3, 4-dimethylhex-3-ene**

143. The following are addition reaction that akenes and alkyne undergo except
A. Hydrogenation B. Halogenation
C. Hydrohalogenation D. **Hypohalogenation**

144. The expected Markovnikovs addition reaction of HI to 2-metyl-2-butene is
A. 2- iodopentane
B. 1-iodo-2-methylbutane
C**. 2-iodo-2-methylbutane**
D. 2-iodo-1-methylbutane
E. 3-iodo-2-methylbutane

145. What is the IUPAC name of the expected major product formed upon reaction of HCl with 1-butene
A. 1-chlorobutane B. **2-chlorobutane**
C. 1-chlorobutene D. 2-chlorobutene
E. 1,2-chloroutane

146. What is the expected major product formed upon reaction of one mole of hydrogen with alkene
A. **Alkane** B. Alkene C. Alkyne
D. Halogenation E. No reaction

147. What is the expected major product formed upon reaction of one mole of hydrogen with alkyne
A. Alkane B**. Alkene** C. Alkyne
D. Haloalkene E. No reaction

148. Ozonolysis is the reaction of an alkane with Ozone
A. True B**. False**

149. Ozonolysis is the reaction of an alkene with trioxygen (Ozone)
A. **True** B. False

150. What is the product formed when 5- chloro-1-meyhylcyclohexene is reduced with a Pt catalyst and H2
A. 1-chloro-5-methylcyclohexane
B. **1-chloro-3-methylcyclohexane**
C. 5-chloro-1-methylcyclohexane
D. 5-methylcyclohexane E. No reaction

151. Which of the following reagents can accomplish the transformation of alkene to alkane
A. Pt/Ni/H2 B. Pt/H C. Ni/H
D. Ni/Pt E. **Ni/H2**

152. How many moles of hydrogen are consumed in the catalytic reduction of 1 mole of 1,3-dibromocyclohexa-1,4-diene
A. 1 B**. 2** C. 3 D. 4 E. 5

153. How many moles of hydrogen are required to completely reduce of 1 mole of cis-2,3,3-trimetylhepta-1,5-diene
A. 0 B. 1 C**. 2** D. 3 E. 4

154. How many moles of hydrogen are consumed in the catalytic reduction of 1 mole of 1,3-dibromocyclohexa-4-diene
A. 0 B**. 1** C. 2 D. 3 E. 4

155. How many moles of hydrogen are required to completely reduce of 1 mole of cis-2,3,3-trimetylhepta-1-diene
A. 0 B. **1** C. 2 D**. 3** E. 4

156. In conducting a catalytic hydrogenation of an alkene, which catalyst listed is most likely soluble in the reaction medium
A. Ni B. Pt C. Pd
D. **Wikinson** E. No reaction

157. Which of the following will yield 2-methylpentane upon catalytic hydrogenation?
A.2-methyl-1-pentene B. 2-methyl-2-pentene
C. 4-methyl-2-pentene D. 4-methyl-1-pentene
E. **All of the above**

158. What is the expected major product upon reaction of 1-pentene with Cl2?
A**.** 2,2-dichloropentane B. 1,1-dichloropentane
C. 2-chloropentane D. 1-chloropentane
E. **1,2-dichloropentane**

159. Treating 2-methyl-2-pentene with Br2 is expected to produce which of the following as the major product?
A. **2,3-dibromo-2-methylpentane**
B**.** 3,3-dibromo-2-methylpentane
C. 2,2-dibromo-2-methylpentane
D. 2-bromo-2-methylpentane
E. 3-dibromo-2-methylpentane

160. The Markovnikov product, resulting from an addition reaction to an unsymmetrical alkenes, is formed because
A. The product is statistically favored.
B. **The reaction proceeds via the more/most stable carbonation.**
C. Steric hindrance favors its formation.
D. The reaction forms the more/most stable product.
E. All of the above are valid reasons

161. What is the correct name for the compound, $CH_3CH2CH=CH-CH2CH=CH-CH_3$
A. 1, 5-octadiene B. **2, 5-octadiene**
C. 3, 5-octadiene D.3, 6-octadiene
E. 2, 6-octadiene

162. Predict the product of the catalytic hydrogenation of 6-ethyl-3-decene.
A. 3-ethyldecane B. **4-ethyldecane**
C. 5-ethyldecane D. 6-ethyldecane
E. 7-ethyldecane

163. Hydrogenation of what alkyne produces propane?
A. Propane B. Propene C. **Propyne**
D. Propynal E. Propynol

164. The term resonance may be defined as a phenomenon whereby a molecule can be represented by two or more structures which have different arrangement of their atoms but same arrangements of their electrons
A. True B**. False**

165. Pentane has lower boiling point than all its isomers?
A. True B**. False**

166. The boiling point of haloalkanes increases with increase with chain length when keeping the halogen constant.
A. **True** B. False

167. The boiling point of haloalkanes increases with increasing halogen substituent.
A. **True** B. False

168. The boiling point of haloalkanes increases with a decrease in chain branching for any given set of isomers.
A. **True** B. False

169. What is the correct name for CH_3-CH2CH=CHCH2-CH=$CHCH_3$
A. Octadiene B. 2, 5-Octadiene
C. 5,2-Octadiene D. 1, 5-Octadiene
E**. 2, 5-Octadiene**

170. Hydrogenation of which alkyne will produce propane in excess hydrogen molecule ?
A. propan B. propane
C. propene D. **propyne**

171. Hydrogenation of which alkene will produce propane
A. propan B. propane C. propene
D. **propyne** E. All of the above

172. What is the product of the reaction between HI and cyclohexene
A. Cyclohene B. Cyclohenecycloiodine
C. **Cyclohexyliodide** D. Cyclohexeneliodide
E. Cyclohexane

173. What is the major product of the reaction between 2-methyl-2-butene and HI
A. iodo-2-methylbutane
B. 1-iodo-2-methylbutane
C**. 2-iodo-3-methylbutane**
D. 2-iodo-2-methylbutane
E. 2-iod-methylbutane

174. What is the product of the reaction between alkyne and 2 moles of hydrogen ?
A. Halogen B. Alkalogen C. Alkene
D. **Alkane** E. alkyne

175. Complete this reaction $C2H_6$ + ? → 2CO2 + 3H2O
A. O2 B. 2O2 C. 3/2O2
D**. 5/2O2** E. 7/2O2

176. Complete this reaction $C2H_6$ + 7/2O2→ 2CO2 + ?
A. 3H2O2 B. $3H_2O$ C. H2O
D. 2H2O E. **3H2**

177. Complete this reaction ? + 7/2O2 → 2CO2 + 3H2O
A. CH B. **$2C2H_6$** C. $C2H_6$
D. $3C2H_6$ E. 4 $C2H_6$

178. Complete the reaction C_3H_8 + ? → 3CO2+ 4H2O
A. O2 B. 2O2 C. 3O2 D. 4O2 E. **5O2**

179. Complete the reaction ? + 5O2→ 3CO2+ 4H2O
A. CH B. $C2H_8$ C. C_3H4
D. **C_3H_8** E. C_3H_3

180. Complete the reaction C_3H_8 + 5O2 → ? + 4H2O

A. CO2 B. 2CO2 C. **3CO2**
D. 4CO2 E. 5CO2

202. Complete the reaction C_3H_8 + 5O2→ 3CO2 +?
A. H2O B. 2H2O C. 3H2O
D. **4H2O** E. 4H4O

203. Complete the reaction $C4H_{10}$ + 9O2 → 4CO2 + ?
A. H2O B. 2H2O C. 3H2O
D. 4H2O E. **5H2O**

204. Complete the reaction $C4H_{10}$ + 9O2 → ? + 5H2O
A. CO2 B. 2CO2 C. 3CO2
D. **4CO2** E. 5CO2

205. Complete the reaction $C4H_{10}$ + ? → 4CO2 + 5H2O
A. 5O2 B. 6O2 C. 7O2
D. 8O2 E. **9O2**

206. Complete the reaction ? + 9O2 → 4CO2 + 5H2O
A. C4H B. $C2H_{10}$ C. $C2H_8$
D. **$C4H_{10}$** E. C_7H_{10}

207. Complete the reaction ? + 11O2 → 5CO2 + 6H2O
A. C_5H_{16} B. C_3H_{12} C. C_5H_{11}
D. C_3H_8 E. **C_5H_{12}**

208. Complete the reaction C_5H_{12} + ? → $5CO_2$+ $6H_2O$
A. **$11O_2$** B. $12O_2$ C. $13O_2$
D. $14O_2$ E. $15O_2$

209. Complete the reaction C_5H_{12} + $11O_2$→ ? + $6H_2O$
A. CO2 B. 2CO2 C. 3CO2
D. 4CO2 E. **5CO2**

210. Complete the reaction C_5H_{12} + 11O2→ $5CO_2$+ ?
A. 2H2O B. 3H2O C. 4H2O
D. 5H2O E. **6H2O**

211. A monohydric alcohols contain..... number of OH group
A. **1** B. 2 C. 3 D. 4 E. 5

222. A dihydric alcohols contain..... number of OH group
A. 1 B**. 2** C. 3 D. 4 E. 5

223. The boiling points of alcohols are substantially higher than those of hydrocarbons of comparable molar masses
A. True B. False

224. What is the product of the reaction $C2H_5OH$ + 3O2→
A. 7HO2 + CO2 B. 3HO2 + 3CO2
C. HO2 + CO2 D. 2HO2 + 2CO2
E. 3HO2 + 2CO2

225. What is the product of the reaction ROH + PCl5→
A. HCl + $POCl_3$ B. RCl + HCl
C. RCl + HCl +$POCl_3$ D. 5RCl + HCl + 2$POCl_3$
E. RCl + $POCl_3$

226. What is the reactant of the reaction ? → RCl + HCl + $POCl_3$
A. ROH + PCl5 B. 2ROH + PCl5
C. ROH + 2PCl5 D. 2ROH + 2PCl5
E. 3 ROH + PCl5

227. Complete the reaction 3ROH + PCl_3 → 3RCl + ?
A. HPO B. H2PO2 C. H_3PO_3
D. H4PO4 E H5PO5

228. Complete the reaction 3ROH + ? → 3RCl + HPO_3
A. PCl B. PCl_2 C. PCl_3
D. PCl_4 E. PCl_5

229. Complete the reaction ROH + ? → RCl + SO2 + HCl
A. SOCl B. $SOCl_2$ C. $SOCl_3$
D. $SOCl_4$ E. $SOCl_5$

230. Complete the reaction ROH + SOCl2→ RCl + ? + ?
A. SO2 B. SO2 + HCl C. SO_3 + HCl
D. SO4 + HCl E. HCl

231. Complete the reaction ? + HCl → CH_3Cl + H2O
A. CH_3OH B. CH_3CH2OH C. CH_3CH_3OH
D. CH_3CH2 E. CH2CH2OH

232. Complete the reaction CH_3OH + HCl→ ? + ?
A. CH_3Cl B. CH_3CH_2Cl C. CH_3Cl + H_2O
D. CH_3CH_2Cl + H_2O E. No reaction

Answers

1 – DBADB DBCAA

11 – ACEAA ABDEA

21 – CCBBA DDBBC

31 – BBAAA CEBBA

41 – BCDAB AABAA

51 – AACBA BAAAA

61 – ABBEA EDADC

71 – ABBBA ABBBA

81 – EAAAA BBADD

91 – BECEE EEEAC Check Q92

101 – ECDCC DDDAB

111 – BAAAA AADBD

121 – DCCBC CBAAA

131 – ABADA BACED

141 – DEDCB ABBAB

151 – EBCBB DEEAB

161 – BBCBB AAAED

171 – DCCDD EBCED

181 – CDEDE DAAEE

191 – ABAEC ACCBB AC