61. During the extraction of gold the following reactions take place –

$$Au + CN^- + H_2O \xrightarrow{O_2} [X]$$

$$[X] + Zn \longrightarrow [Y] + Au$$

X and Y are respectively –

1) $\left[Au(CN)_2\right]^-$ and $\left[Zn(CN)_4\right]^{2-}$ 2) $\left[Au(CN)_4\right]^{3-}$ and $\left[Zn(CN)_4\right]^{2-}$

3) $\left[Au(CN)_4\right]^{2-}$ and $\left[Zn(CN)_4\right]^{2-}$ 4) $\left[Au(CN)_2\right]^-$ and $\left[Zn(CN)_6\right]^{4-}$

62. The number of gram molecules of chlorine in 6.02×10^{25} hydrogen chloride molecules is –

1) 5 2) 50

3) 100 4) 10

63. Graphite is a soft solid lubricant extremely difficult to melt. The reason for this anomalous behaviour is that graphite –

1) has molecules of variable molecular masses like polymers.
2) has carbon atoms arranged in large plates of rings of strongly bound carbon atoms with weak interplate bonds.
3) is a non-crystalline substance.
4) is an allotropic form of carbon.

64. Paracetamol is a / an

1) antimalarial 2) antipyretic

3) analgesic 4) both 2 and 3

65. Which one of the following has maximum number of atoms of oxygen ?

1) 2 g of water 2) 2 g of sulphur dioxide

3) 2 g of carbon dioxide 4) 2 g of carbon monoxide.

(Space for Rough Work)

shiksha

66. Which one of the following shows functional isomerism ?

1) CH_2Cl_2 2) C_2H_5OH

3) C_3H_6 4) C_2H_4

67. In the ionic equation – $BiO_3^- + 6H^+ + Xe^- \longrightarrow Bi^{3+} + 3H_2O$,

the values of X is –

1) 3 2) 4

3) 2 4) 6

68. Molarity of a given orthophosphoric acid solution is 3M. It's normality is –

1) 1 N 2) 3 N

3) 0.3 N 4) 9 N

69. Acidified sodium fusion extract on addition of ferric chloride solution gives blood red colouration which confirms the presence of –

1) S 2) N

3) N and S 4) S and Cl

70. A body of mass 10 mg is moving with a velocity of 100 ms^{-1}. The wavelength of de-Broglie wave associated with it would be –

(Note : $h = 6.63\times10^{-34}$ Js)

1) 6.63×10^{-37} m 2) 6.63×10^{-31} m

3) 6.63×10^{-34} m 4) 6.63×10^{-35} m

(Space for Rough Work)

shiksha

71. Mg^{2+} is isoelectronic with

1) Ca^{2+} 2) Na^{+}

3) Zn^{2+} 4) Cu^{2+}

72. Gram molecular volume of oxygen at STP is –

1) 11200 cm^3 2) 22400 cm^3

3) 5600 cm^3 4) 3200 cm^3

73. Presence of halogen in organic compounds can be detected using –

1) Beilstien's test 2) kjeldahl test

3) Duma's test 4) Leibig's test

74. The electronic configuration of Cr^{3+} is

1) $[Ar]3d^5 4s^1$ 2) $[Ar]3d^2 4s^1$

3) $[Ar]3d^3 4s^0$ 4) $[Ar]3d^4 4s^2$

75. The mass of a metal, with equivalent mass 31.75, which would combine with 8 g of oxygen is

1) 31.75 2) 3.175

3) 8 4) 1

(Space for Rough Work)

shiksha

76. Benzene reacts with chlorine in sunlight to give a final product –

1) C_6H_5Cl 2) C_6Cl_6

3) $C_6H_6Cl_6$ 4) CCl_4

77. In the periodic table metals usually used as catalysts belong to

1) s - block 2) p - block

3) d - block 4) f - block

78. Dalton's law of partial pressures is applicable to which one of the following systems ?

1) $CO + H_2$ 2) $H_2 + Cl_2$

3) $NO + O_2$ 4) $NH_3 + HCl$

79. The general formula of a cycloalkane is

1) C_nH_{2n+2} 2) C_nH_{2n-2}

3) C_nH_{2n} 4) C_nH_n

80. In acetylene molecule, between the carbon atoms there are –

1) three sigma bonds 2) two sigma and one pi bonds

3) one sigma and two pi bonds 4) three pi bonds

(Space for Rough Work)

shiksha

81. Denatured alcohol is

1) Rectified spirit
2) Undistilled ethanol
3) Rectified spirit + methanol + naphtha
4) Ethanol + methanol

82. During the formation of a chemical bond

1) energy decreases
2) energy increases
3) energy of the system does not change
4) electron-electron repulsion becomes more than the nucleus-electron attraction

83. One mole of oxygen at 273 k and one mole of sulphur dioxide at 546 k are taken in two separate containers, then,

1) kinetic energy of O_2 > kinetic energy of SO_2.
2) kinetic energy of O_2 < kinetic energy of SO_2.
3) kinetic energy of both are equal.
4) None of these

84. $+I$ effect is shown by

1) $-NO_2$
2) $-Cl$
3) $-Br$
4) $-CH_3$

85. Formation of coloured solution is possible when metal ion in the compound contains

1) paired electrons
2) unpaired electrons
3) lone pair of electrons
4) none of these

(Space for Rough Work)

shiksha

86. Which of the following is an intensive property ?

1) temperature
2) surface tension
3) viscosity
4) all of these

87. Hofmann's bromamide reaction is to convert

1) amine to amide
2) amide to amine
3) alcohol to acid
4) acid to alcohol

88. IUPAC name of $Na_3\left[Co(NO_2)_6\right]$ is

1) sodium cobaltinitrite
2) sodium hexanitrito cobaltate (III)
3) sodium hexanitro cobalt (III)
4) sodium hexanitrito cobaltate (II)

89. Thermodynamic standard conditions of temperature and pressure are

1) 0^0C and 1 atm
2) 273 k and 101.3 k Pa
3) 298 k and 1 atm
4) 0^0C and 101.3 k Pa

90. How many chiral carbon atoms are present in 2, 3, 4 - trichloropentane ?

1) 3
2) 2
3) 1
4) 4

(Space for Rough Work)

91. The number of unidentate ligands in the complex ion is called

1) EAN
2) Coordination number
3) primary valency
4) oxidation number

92. $2SO_{2(g)} + O_{2(g)} \overset{V_2O_5}{\rightleftharpoons}$ is an example for

1) irreversible reaction
2) heterogenous catalysis
3) homogenous catalysis
4) neutralisation reaction

93. The amino acid which is not optically active is

1) glycine
2) alanine
3) serine
4) lactic acid

94. For a stable molecule the value of bond order must be

1) negative
2) positive
3) zero
4) there is no relationship between stability and bond order.

95. Which one of the following is a second order reaction ?

1) $CH_3COOCH_3 + NaOH \longrightarrow CH_3COONa + H_2O$
2) $H_2 + Cl_2 \xrightarrow{\text{sunlight}} 2HCl$
3) $NH_4NO_3 \longrightarrow N_2 + 3H_2O$
4) $H_2 + Br_2 \longrightarrow 2HBr$

(Space for Rough Work)

96. According to Bayer's strain theory which is highly stable ?

1) cyclohexane
2) cycloheptane
3) cyclopentane
4) cyclobutane

97. The number of antibonding electron pairs in O_2^{2-} molecular ion on the basis of molecular orbital theory is

[Note - Atomic number of O is 18]

1) 2
2) 3
3) 4
4) 5

98. Hydroxyl ion concentration of 1M HCl is

1) 1×10^{-14} mol dm^{-3}
2) 1×10^{-1} mol dm^{-3}
3) 1×10^{-13} mol dm^{-3}
4) 1×10^{1} mol dm^{-3}

99. Geometrical isomerism is shown by

1) $-C-C-$
2) $-C\equiv C-$
3) $\rangle C=C\langle$
4) None of these

100. The oxidation state of iron in $K_4\left[Fe(CN)_6\right]$ is

1) 2
2) 3
3) 4
4) 1

(Space for Rough Work)

shiksha

101. In which of the following process, a maximum increase in entropy is observed ?

1) dissolution of salt in water
2) condensation of water
3) sublimation of naphthalene
4) melting of ice

102. Decomposition of benzene diozonium chloride by using Cu_2Cl_2/HCl to form chlorobenzene is

1) Cannizarro's reaction
2) Kolbe's reaction
3) Sandmeyer's reaction
4) Raschig's reaction

103. Which complex can not ionise in solution ?

1) $\left[pt(NH_3)_6\right]Cl_4$
2) $K_2\left[pt(F_6)\right]$
3) $K_4\left[Fe(CN)_6\right]$
4) $\left[CoCl_3(NH_3)_3\right]$

104. Considering the reaction $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)} + 393.5\ kJ$ the signs of ΔH, ΔS and ΔG respectively are

1) $-, +, -$
2) $-, -, -$
3) $-, +, +$
4) $+, -, -$

105. The product formed when hydroxylamine condenses with a carbonyl compound is called

1) hydrazone
2) hydrazine
3) oxime
4) hydrazide

(Space for Rough Work)

106. Which of the following forms a colourless solution in aqueous medium?

1) Ti^{3+} 2) Sc^{3+}

3) V^{3+} 4) Cr^{3+}

107. When a sulphur sol is evaporated sulphur is obtained. On mixing with water sulphur sol is not formed. The sol is

1) hydrophilic 2) hydrophobic

3) reversible 4) lyophilic

108. An alkyl halide reacts with alcoholic ammonia in a sealed tube, the product formed will be

1) a primary amine 2) a secondary amine

3) a tertiary amine 4) a mixture of all the three

109. When conc. H_2SO_4 is heated with P_2O_5, the acid is converted into

1) sulphur
2) sulphur dioxide
3) sulphur trioxide
4) a mixture of sulphur dioxide and sulphur trioxide

110. Entropy of the universe is

1) continuously increasing 2) continuously decreasing

3) zero 4) constant

(Space for Rough Work)

shiksha

111. Which of the following salts on being dissolved in water gives pH > 7 at 25^0C ?

1) NH_4CN 2) NH_4Cl

3) KNO_3 4) KCN

112. The reagent used in Clemmenson's reduction is

1) alc. KOH 2) aq. KOH

3) $Zn-Hg$ / con. HCl 4) Conc. H_2SO_4

113. When KBr is dissolved in water, K^+ ions are

1) oxidised 2) reduced

3) hydrolysed 4) hydrated

114. The noble gas mixture is cooled in a coconut bulb at 173 K. The gases that are not adsorbed are

1) He and Ne 2) Ar and Kr

3) He and Xe 4) Ne and Xe

115. The volume of 10N and 4N HCl required to make 1 litre of 7N HCl are

1) 0.75 litre of 10N HCl and 0.25 litre of 4N HCl

2) 0.80 litre of 10N HCl and 0.20 litre of 4N HCl

3) 0.60 litre of 10N HCl and 0.40 litre of 4N HCl

4) 0.50 litre of 10N HCl and 0.50 litre of 4N HCl

(Space for Rough Work)

shiksha

116. A metal present in insulin is

1) copper
2) iron
3) zinc
4) aluminium

117. Carbon forms two oxides which have different compositions. The equivalent mass of which remains constant ?

1) carbon
2) oxygen
3) neither carbon nor oxygen
4) both carbon and oxygen

118. Maximum number of molecules of CH_3I that can react with a molecule of CH_3NH_2 are

1) 1
2) 2
3) 4
4) 3

119. Ellingham diagram represents a graph of

1) ΔG Vs T
2) ΔG^0 Vs T
3) ΔS Vs P
4) ΔG Vs P

120. Identify the ore not containing iron

1) chalcopyrites
2) carnallite
3) siderite
4) limonite

(Space for Rough Work)