

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) Beilstein'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

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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

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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 |

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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 $Na_3[Co(NO_2)_6]$ 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) $0^\circ C$ and 1 atm
 - 2) 273 k and 101.3 k Pa
 - 3) 298 k and 1 atm
 - 4) $0^\circ C$ 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

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91. The number of unidentate ligands in the complex ion is called
- 1) EAN
 - 2) Coordination number
 - 3) primary valency
 - 4) oxidation number
92. $2SO_{2(g)} + O_{2(g)} \xrightleftharpoons{V_2O_5}$ 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) $H_2 + Br_2 \longrightarrow 2HBr$

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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) $1 \times 10^{-14} \text{ mol dm}^{-3}$
 - 2) $1 \times 10^{-1} \text{ mol dm}^{-3}$
 - 3) $1 \times 10^{-13} \text{ mol dm}^{-3}$
 - 4) $1 \times 10^1 \text{ mol dm}^{-3}$
99. Geometrical isomerism is shown by
- 1) $-C-C-$
 - 2) $-C \equiv C-$
 - 3) $\diagup C = C \diagdown$
 - 4) None of these
100. The oxidation state of iron in $K_4[Fe(CN)_6]$ is.
- 1) 2
 - 2) 3
 - 3) 4
 - 4) 1

(Space for Rough Work)

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) Cannizzarro's reaction
 - 2) Kolbe's reaction
 - 3) Sandmeyer's reaction
 - 4) Raschig's reaction
103. Which complex can not ionise in solution ?
- 1) $[Pt(NH_3)_6]Cl_4$
 - 2) $K_2[Pt(F_6)]$
 - 3) $K_4[Fe(CN)_6]$
 - 4) $[CoCl_3(NH_3)_3]$
104. Considering the reaction $C(s) + O_2(g) \rightarrow CO_2(g) + 393.5 \text{ kJ}$ 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

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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 |

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111. Which of the following salts on being dissolved in water gives $\text{pH} > 7$ at 25°C ?

- | | |
|---------------------------|---------------------------|
| 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 |

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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)