61. The correct order in which the first ionisation potential increases is

1) *Na*, *K*, *Be* 2) *K*, *Na*, *Be*

3) *K*, *Be*, *Na* 4) *Be*, *Na*, *K*

62. 10 cm^3 of 0.1 N monobasic acid requires 15 cm^3 of sodium hydroxide solution whose normality is

1) 1.5 N 2) 0.15 N

3) 0.066 N 4) 0.66 N

63. The IUPAC name for tertiary butyl iodide is

1) 4-Iodobutane 2) 2-Iodobutane

3) 1-Iodo, 3-methyl propane 4) 2-Iodo 2-methyl propane

64. When sulphur dioxide is passed in an acidified $K_2Cr_2O_7$ solution, the oxidation state of sulphur is changed from

1) + 4 to 0 2) + 4 to + 2

3) + 4 to + 6 4) + 6 to + 4

65. Mass of 0.1 mole of Methane is

1) 1 g 2) 16 g

3) 1.6 g 4) 0.1 g

(Space for Rough Work)

66. Methoxy methane and ethanol are

1) Position isomers
2) Chain isomers
3) Functional isomers
4) Optical isomers

67. When the azimuthal quantum number has the value of 2, the number of orbitals possible are

1) 7
2) 5
3) 3
4) 0

68. For the reaction $Fe_2O_3 + 3CO \longrightarrow 2Fe + 3CO_2$ the volume of carbon monoxide required to reduce one mole of ferric oxide is

1) 22.4 dm^3
2) 44.8 dm^3
3) 67.2 dm^3
4) 11.2 dm^3

69. The monomers of Buna-S rubber are

1) vinyl chloride and sulphur
2) butadiene
3) styrene and butadiene
4) isoprene and butadiene

70. An element with atomic number 21 is a

1) halogen
2) representative element
3) transition element
4) alkali metal

(Space for Rough Work)

71. The maximum number of hydrogen bonds that a molecule of water can have is
1) 1 2) 2
3) 3 4) 4

72. A gas deviates from ideal behaviour at a high pressure because its molecules
1) attract one another 2) show the Tyndall effect
3) have kinetic energy 4) are bound by covalent bonds

73. The reagent used to convert an alkyne to alkene is
1) Zn / HCl 2) Sn / HCl
3) $Zn-Hg$ / HCl 4) Pd / H_2

74. When compared to ΔG^0 for the formation of Al_2O_3, the ΔG^0 for the formation of Cr_2O_3 is
1) higher 2) lower
3) same 4) unpredicted

75. In order to increase the volume of a gas by 10%, the pressure of the gas should be
1) increased by 10 % 2) increased by 1 %
3) decreased by 10 % 4) decreased by 1 %

(Space for Rough Work)

76. Catalytic dehydrogenation of a primary alcohol gives a

1) secondary alcohol
2) aldehyde
3) ketone
4) ester

77. Excess of PCl_5 reacts with conc. H_2SO_4 giving

1) chlorosulphonic acid
2) thionyl chloride
3) sulphuryl chloride
4) sulphurous acid

78. If one mole of ammonia and one mole of hydrogen chloride are mixed in a closed container to form ammonium chloride gas, then

1) $\Delta H > \Delta u$
2) $\Delta H = \Delta u$
3) $\Delta H < \Delta u$
4) there is no relationship

79. The compound on dehydrogenation gives a ketone. The original compound is

1) primary alcohol
2) secondary alcohol
3) tertiary alcohol
4) carboxylic acid

80. Which is the most easily liquifiable rare gas ?

1) *Xe*
2) *Kr*
3) *Ar*
4) *Ne*

(Space for Rough Work)

81. Mesomeric effect involves delocalisation of

1) *pi* electrons 2) sigma electrons

3) protons 4) none of these

82. Which of the following has the maximum number of unpaired '*d*' electrons ?

1) Zn^{2+} 2) Fe^{2+}

3) Ni^{3+} 4) Cu^{+}

83. One mole of which of the following has the highest entropy?

1) liquid nitrogen 2) hydrogen gas

3) mercury 4) diamond

84. Which of the following species does not exert a resonance effect ?

1) $C_6H_5NH_2$ 2) $C_6H_5\overset{+}{N}H_3$

3) C_6H_5OH 4) C_6H_5Cl

85. A complex compound in which the oxidation number of a metal is zero is

1) $K_4[Fe(CN)_6]$ 2) $K_3[Fe(CN)_6]$

3) $[Ni(CO)_4]$ 4) $[Pl(NH_3)_4]Cl_2$

(Space for Rough Work)

86. Three moles of PCl_5, three moles of PCl_3 and two moles of Cl_2 are taken in a closed vessel. If at equilibrium the vessel has 1.5 moles of PCl_5, the number of moles of PCl_3 present in it is

1) 5 2) 3

3) 6 4) 4.5

87. How many optically active stereomers are possible for butan-2, 3-diol ?

1) 1 2) 2

3) 3 4) 4

88. An octahedral complex is formed when hybrid orbitals of the following type are involved

1) sp^3 2) $d\,sp^2$

3) d^2sp^3 4) sp^2d^2

89. For the reaction $2HI_{(g)} \rightleftharpoons H_{2(g)} + I_{2(g)} - Q\,KJ$, the equilibrium constant depends upon

1) temperature 2) pressure

3) catalyst 4) volume

90. The angle strain in cyclobutane is

1) $24^0 44'$ 2) $29^0 16'$

3) $19^0 22'$ 4) $9^0 44'$

(Space for Rough Work)

91. The number of nodal planes present in $\sigma^* s$ antibonding orbitals is

1) 1 2) 2

3) 0 4) 3

92. Which of the following electrolytic solutions has the least specific conductance ?

1) 0.02 N 2) 0.2 N

3) 2 N 4) 0.002 N

93. The overlapping of orbitals in benzene is of the type

1) $sp - sp$ 2) $p - p$

3) $sp^2 - sp^2$ 4) $sp^3 - sp^3$

94. The calculated bond order of superoxide ion $\left(O_2^-\right)$ is

1) 2.5 2) 2

3) 1.5 4) 1

95. Which of the following can be measured by the Ostwald-Walker dynamic method ?

1) Relative lowering of vapour pressure
2) Lowering of vapour pressure
3) Vapour pressure of the solvent
4) all of these

(Space for Rough Work)

96. *n*-propyl bromide on treating with alcoholic *KOH* produces

1) propane
2) propene
3) propyne
4) propanol

97. Mercury is a liquid metal because

1) it has a completely filled *s*-orbital
2) it has a small atomic size
3) it has a completely filled *d*-orbital that prevents *d-d* overlapping of orbitals
4) it has a completely filled *d*-orbital that causes *d-d* overlapping

98. A compound is formed by elements *A* and *B*. This crystallises in the cubic structure where the *A* atoms are at the corners of the cube and *B* atoms are at the body centres. The simplest formula of the compound is

1) AB
2) A_6B
3) A_8B_4
4) AB_6

99. Anisole can be prepared by the action of methyl iodide on sodium phenate. The reaction is called

1) Wurtz's reaction
2) Williamson's reaction
3) Fittig's reaction
4) Etard's reaction

100. Malleability and ductility of metals can be accounted due to

1) the presence of electrostatic force
2) the crystalline structure in metal
3) the capacity of layers of metal ions to slide over the other
4) the interaction of electrons with metal ions in the lattice

(Space for Rough Work)

101. An ionic compound is expected to have tetrahedral structure if r_+/r_- lies in the range of

1) 0.414 to 0.732
2) 0.225 to 0.414
3) 0.155 to 0.225
4) 0.732 to 1

102. Among the following, which is least acidic ?

1) phenol
2) O-cresol
3) p-nitrophenol
4) p-chlorophenol

103. A ligand can also be regarded as

1) Lewis acid
2) Bronsted base
3) Lewis base
4) Bronsted acid

104. The colour of sky is due to

1) transmission of light
2) wavelength of scattered light
3) absorption of light by atmospheric gases
4) All of these

105. Which of the following organic compounds answers to both iodoform test and Fehling's test?

1) ethanol
2) methanal
3) ethanal
4) propanone

(Space for Rough Work)

106. Helium is used in balloons in place of hydrogen because it is

1) incombustible
2) lighter than hydrogen
3) radioactive
4) more abundant than hydrogen

107. The basic principle of Cottnell's precipitator is

1) Le-chatelier's principle
2) peptisation
3) neutralisation of charge on colloidal particles
4) scattering of light

108. When carbon monoxide is passed over solid caustic soda heated to 200^0C, it forms

1) Na_2CO_3
2) $NaHCO_3$
3) $HCOONa$
4) CH_3COONa

109. $N_2 + 3H_2 \rightleftharpoons 2NH_3$ + heat. What is the effect of the increase of temperature on the equilibrium of the reaction?

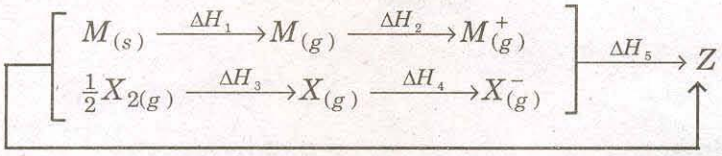
1) equilibrium is shifted to the left
2) equilibrium is shifted to the right
3) equilibrium is unaltered
4) reaction rate does not change

110. Hydrogen gas is not liberated when the following metal is added to dil. HCl

1) Ag
2) Zn
3) Mg
4) Sn

(Space for Rough Work)

111. Consider the Born-Haber cycle for the formation of an ionic compound given below and identify the compound (*Z*) formed.



1) M^+X^- 2) $M^-X^-_{(s)}$

3) MX 4) $M^+X^-_{(g)}$

112. In the brown ring test, the brown colour of the ring is due to

1) ferrous nitrate 2) ferric nitrate

3) a mixture of NO and NO_2 4) nitrosoferrous sulphate

113. Amines behave as

1) Lewis acids 2) Lewis base

3) aprotic acid 4) neutral compound

114. Dalda is prepared from oils by

1) oxidation 2) reduction

3) hydrolysis 4) distillation

115. The chemical name of anisole is

1) Ethanoic acid 2) Methoxy benzene

3) Propanone 4) Acetone

(Space for Rough Work)

116. The number of disulphide linkages present in insulin are

1) 1 2) 2

3) 3 4) 4

117. 80 g of oxygen contains as many atoms as in

1) 80 g of hydrogen 2) 1 g of hydrogen

3) 10 g of hydrogen 4) 5 g of hydrogen

118. Which metal has a greater tendency to form metal oxide ?

1) Cr 2) Fe

3) Al 4) Ca

119. Identify the reaction that does not take place in a blast furnace.

1) $CaCO_3 \longrightarrow CaO + CO_2$ 2) $CaO + SiO_2 \longrightarrow CaSiO_3$

3) $2Fe_2O_3 + 3C \longrightarrow 4Fe + 3CO_2$ 4) $CO_2 + C \longrightarrow 2CO$

120. Waxes are esters of

1) glycerol
2) long chain alcohols
3) glycerol and fatty acid
4) long chain alcohols and long chain fatty acids

(Space for Rough Work)