CHEMISTRY

(English Version)

Each question carries 1 mark

Full Marks : 50

51. Which is the correct IUPAC name for $CH_3 - CH(C_2H_5) - CH_2Br$

(A) 1-bromo-2-ethyl propane
(B) 3-bromo pentane
(C) 1-bromo-2-methyl butane
(D) 1-bromo pentane

52. Hyperconjugation involves delocalization of

(A) σ - electron
(B) π - electron
(C) Both σ - and π - electrons
(D) Proton

53. For a process to occur under adiabatic conditions, the correct condition is

(A) $\Delta T = 0$
(B) $\Delta P = 0$
(C) $q = 0$
(D) $w = 0$

54. In which case Bohr's theory is not applicable?

(A) H^+
(B) He^+
(C) Li^{2+}
(D) Ne^{9+}

55. The correct quantum number sequence for the outer most electron of potassium is

(A) $4, 1, 1, \frac{1}{2}$
(B) $4, 0, -1, \frac{1}{2}$
(C) $4, 1, 0, \frac{1}{2}$
(D) $4, 0, 0, \frac{1}{2}$

56. Which of the following has pyramidal shape?

(A) CH_3^+
(B) $CH_3 - CH_2^+$
(C) $\dot{C}H_3$
(D) $\ddot{C}H_3^-$

57. The reaction $CH_3CH_2CH_2Cl \xrightarrow{aq.KOH} CH_3CH_2CH_2OH$ is an example of

(A) Free radical substitution
(B) Addition reaction
(C) Elimination reaction
(D) Nucleophilic substitution

58. A system is taken from state A to state B along two different paths 1 and 2. Heat absorbed and work done by the system along these paths are Q_1, Q_2, W_1 and W_2 respectively. Then

(A) $Q_1 = Q_2$

(B) $W_1 = W_2$

(C) $Q_1 - W_1 = Q_2 - W_2$

(D) $Q_1 + W_1 = Q_2 + W_2$

59. A pressure vessel contains a gaseous mixture made up of 64 g of gas A (molecular weight 32) and 14 g of gas B (molecular weight 28). Then the mole fraction of gas A is

(A) 0. 50

(B) 0.8

(C) 0. 95

(D) 0.2

60. Which of the following compounds will not give Lassaigne's test for nitrogen?

(A) Azobenzene

(B) Hydrazine

(C) Phenyl hydrazine

(D) Urea

61. The most suitable method of the separation of a 1:1 mixture of ortho and para - nitro phenols is

(A) Crystallization

(B) Chromatography

(C) Steam distillation

(D) Sublimation

62. Which one is non polar?

(A) BF_3

(B) NF_3

(C) PF_3

(D) ClF_3

63. Na_2HPO_3 is

(A) an acid salt

(B) a basic salt

(C) a double salt

(D) a normal salt

64. We have a jar 'A' filled with a gas characterized by parameters P, V and T. Another jar 'B' is filled with a gas with parameters $2P$, $V/2$ and $2T$, where symbols have their usual meanings. The ratio of the number of molecules in jar 'A' to those in jar 'B' is

(A) 1 : 1

(B) 1 : 2

(C) 2 : 1

(D) 4 : 1

65. Select the true statement(s)

The entropy will usually increase when

(I) a molecule is broken into two or more smaller molecules.

(II) a reaction occurs that results in an increase in the number of moles of gas.

(III) a solid changes to a liquid.

(IV) a liquid changes to a gas.

(A) I only

(B) II only

(C) IV only

(D) I, II, III, and IV

74. Which one of the followings protects life on earth from ultra violet radiation?

(A) Ozonosphere
(B) Ionosphere
(C) Troposphere
(D) Thermosphere

75. Which of the following reagents is used to separate ethylene from acetylene in a mixture?

(A) Fuming H_2SO_4
(B) Pyrrogalols
(C) Ammonical Cu_2Cl_2
(D) Charcoal Powder

76. Marsh gas is

(A) N_2O
(B) PH_3
(C) CH_4
(D) NO

77. Increasing order of acid strength is

(A) $BI_3 > BBr_3 > BCl_3 > BF_3$
(B) $BCl_3 > BF_3 > BBr_3 > BI_3$
(C) $BI_3 > BF_3 > BCl_3 > BBr_3$
(D) $BF_3 > BCl_3 > BBr_3 > BI_3$

78. Which of the following does not represent the mathematical expression for the Heisenberg uncertainty principle?

(A) $\Delta x \cdot \Delta p \geq \frac{h}{(4\pi)}$
(B) $\Delta x \cdot \Delta v \geq \frac{h}{(4\pi)}$
(C) $\Delta E \cdot \Delta t \geq \frac{h}{(4\pi)}$
(D) $\Delta E \cdot \Delta x \geq \frac{h}{(4\pi)}$

79. 1-chlorobutane on reaction with alcoholic potash gives

(A) 1-butene
(B) 1-butanol
(C) 2-butene
(D) 2-butanol

80. If, in the reaction $N_2O_4 \rightleftharpoons 2NO_2$, x is the degree of dissociation of N_2O_4, then the number of molecules at equilibrium will be

(A) 1
(B) 3
(C) $(1+x)$
(D) $(1+x)^2$

81. When ethyl magnesium bromide is treated with heavy water (D_2O), the structure of organic compound formed is

(A) $C_2H_5 - C_2H_5$
(B) C_2H_5OD
(C) C_2H_6
(D) C_2H_5D

82. The reduction potential value for the reaction : $Au^{3+}\ 3e \rightarrow Au$ is [Given : $Au^{+}/Au = 1.7\ V$ & $Au^{3+}/Au^{+} = 1.4\ V$]

(A) 1.5 V
(B) 0.3 V
(C) 0.5 V
(D) 3.1 V

83. If K_{sp} is the solubility product of a sparingly soluble salt A_3X_2, then its solubility is

(A) $\left(K_{sp}/108\right)^{1/5}$
(B) $\left(K_{sp}\right)^{1/5}$
(C) $\left(K_{sp}/72\right)^{1/5}$
(D) $\left(K_{sp}\right)^{1/2}$

84. One molecule of sucrose on hydrolysis gives

(A) Two molecules of glucose
(B) Two molecules of glucose + one molecule of fructose
(C) One molecule of glucose + one molecule of fructose
(D) Two molecules of fructose

85. Which of the following compounds does not undergo aldol condensation?

(A) CH_3CHO
(B) $C_6H_5–CHO$
(C) $CH_3COCH_2CH_3$
(D) $CH_3-\overset{\overset{O}{\|}}{C}-CH_3$

86. Identify the reaction order from each of the following rate constant units.

(i) $R = 2.5\times10^{-4}\ mol^{-1}L\ S^{-1}$

(ii) $R = 4.0\times10^{-4}\ S^{-1}$

(A) (i) 2 (ii) 1
(B) (i) 1 (ii) 2
(C) (i) 0 (ii) 1
(D) (i) 2 (ii) 0

87. Which one has the largest ionic radius?

(A) Ca^{2+}
(B) S^{2-}
(C) Cl^{-}
(D) K^{+}

88. Which one is not correct for carbon di oxide?

(A) It is a green house gas
(B) It shows oxidizing property at high temperature
(C) It turns acidified dichromate solution to green
(D) It is acidic oxide

89. The aqueous solution of ammonium chloride will be

(A) Neutral
(B) Alkaline
(C) Acidic
(D) Amphoteric

90. A 5.2 molal aqueous solution of methyl alcohol (CH_3OH) is supplied. What is the mole fraction of methyl alcohol in the solution?

(A) 0.050
(B) 0.100
(C) 0.190
(D) 0.086

91. Which of the followings will form iodoform on treatment with I_2 and aqueous $NaOH$?

(A) $CH_3CH_2CH_2CH_2CHO$
(B) $CH_3CH_2COCH_2CH_3$
(C) $CH_3CH_2CH_2CH_2CH_2OH$
(D) $CH_3CH_2CH_2CH(OH)CH_3$

92. Approximate normality of conc. HCl in laboratory is

(A) 12(N)
(B) 5(N)
(C) 18(N)
(D) 36(N)

93. When $NaCl$ is dissolved in water its

(A) melting point decreases
(B) boiling point decreases
(C) both melting and boiling points decrease
(D) none of above is true

94. The correct order of osmotic pressure of equimolar solution of $BaCl_2$, $NaCl$ and glucose will be

(A) glucose > $NaCl$ > $BaCl_2$
(B) glucose > $BaCl_2$ > $NaCl$
(C) $NaCl$ > $BaCl_2$ > glucose
(D) $BaCl_2$ > $NaCl$ > glucose

95. Which pair of the following is natural polymer?

(A) Starch and Nylon
(B) Starch and Cellulose
(C) Proteins and Nylon
(D) Proteins and PVC

96. Which among the following is not an antibiotic?

(A) Erythromycin
(B) Oxytocin
(C) Penicillin
(D) Tetracycline

97. Geometry of crystallized sodium chloride, $NaCl$ is

(A) Simple cubic
(B) Body centred cubic
(C) Face centred cubic
(D) Tetragonal

98. Oxidation state of iron in Mohr's salt is

(A) 0
(B) +1
(C) +2
(D) +3

99. One mole of oxygen at 273 K and one mole of sulphur dioxide at 546 K are kept in two separate containers. Then

(A) kinetic energy of O_2 > kinetic energy of SO_2

(B) kinetic energy of O_2 < kinetic energy of SO_2

(C) kinetic energy of both are equal

(D) none of these is true

100. 10g each of CH_4 and O_2 are kept in cylinders of same volume under same temperatures. The pressure ratio of two gases is

(A) 2 : 1

(B) 1 : 4

(C) 2 : 3

(D) 3 : 4