46. The number of water molecules in 1 L of water is

a) 18 b) 18×1000 c) N_A d) $55.55\ N_A$

47. A sample of a mixture of $CaCl_2$ and $NaCl$ weighing 4.22 g was treated to precipitate all the Caas $CaCO_3$. This $CaCO_3$ is then heated and quantitatively converted into 0.959 g of CaO. Calculate the percentage of $CaCl_2$ in the mixture.
(Atomic mass of $Ca = 40, O = 16, C = 12$ and $Cl = 35.5$)

a) 31.5% b) 21.5% c) 45.04% d) 68.48%

48. Which of the following is Heisenberg uncertainty principle?

a) $\Delta x.\Delta p \geq \frac{h}{4\pi}$ b) $\Delta x.\Delta p = \frac{h}{4\pi}$

c) $\Delta x.\Delta p \leq \frac{h}{4\pi}$ d) $\Delta x.\Delta p < \frac{h}{4\pi}$

49. The lightest particle is

a) -particle b) Positron

c) Proton d) Neutron

50. The correct order of decreasing first ionisation energy is

a) C > B > Be > Li b) C > Be > B > Li

c) B > C > Be > Li d) Be > Li > B > C

51. Structure of ammonia is

a) Pyramidal b) Tetrahedral

c) Trigonal d) Trigonal pyramidal

52. Compound X is anhydride of sulphuric acid. The number of σ bonds and the number of π - bonds present in $X$are, respectively.

a) 3, 3 b) 4, 2

c) 2, 4 d) 4, 3

53. Frenkel defect is found in crystals in which the radius ration is

a) 1.5

b) 1.7

c) Very low

d) Slightly less than unity

54. Heat of combustion of a substance:

a) Is always positive

b) Is always negative

c) Is equal to heat of formation

d) Nothing can be said without reaction

55. Molar heat of vaporisation of a liquid is 6 kJ mol^{-1}. If the entropy change is 16 J $mol^{-1}K^{-1}$, the boiling point of the liquid is

a) 375℃ b) 375 K c) 273K d) 102℃

56. Formation of SO_3 from SO_2 and O_2 is favoured by

a) Increase in pressure

b) Decrease in pressure

c) Increase in temperature

d) Decrease in temperature

57. Which is the best description of behaviour of bromine in the reaction given below?

$H_2O + Br_2 \longrightarrow HBr + HOBr$

a) Proton accepted only

b) Both oxidised and reduced

c) Oxidised only

d) Reduced only

58. The oxidation state of sulphur in sodium tetrathionate ($Na_2S_4O_6$) is

a) 2 b) 0 c) 2.5 d) 3.5

59. The hardness of water is estimated by

a) EDTA method b) Titrimetic method

c) Conductivity method d) Distillation method

60. Pick out the statement (s) which is (are) not true about the diagonal relationship of Li and Mg.

(i) Polarising powers of Li^+ and Mg^{2+} are almost same.

(ii) L like Li, Mg decomposes water very fast.

(iii) LiCl and $MgCl_2$ are deliquescent.

(iv) Like Li, Mg does not form solid bicarbonates.

a) (i) and (ii) b) (ii) and (iii)

c) Only (ii) d) Only (i)

61. The colour of blue glass is due to the presence of oxide of

a) Cr b) Co c) Au d) Ag

62. Red lead in an example of a/an…oxide

a) Basic
b) Mixed
c) Super
d) Amphoteric

63. Among the following the strongest nucleophile is

a) C_2H_5SH
b) CH_3COO^-
c) CH_3NH_2
d) $NCCH_2^-$

64. The final product in following sequence of reaction is

$CH \equiv CH \xrightarrow{NaNH_2} A \xrightarrow{CH_3Br} B$

a) $CH_2 = CH - CH = CH_2$
b) $HC \equiv C - CH_3$
c) $CH_2 = CH - CH_3$
d) $CH_3 - CH_2 - CH_3$

65. Which compound does not give precipitate with ammoniacal silver nitrate solution?

a) $C_2H_5 - C \equiv CH$
b) $CH_3 - C \equiv C - CH_3$
c) $\begin{array}{l} \\ | \\ CH_3 - CH - C \equiv CH \end{array}$ $\begin{array}{l} CH_3 \\ \\ \\ \end{array}$
d) $Ph - CH_2 - C \equiv CH$

66. Gas released during Bhopal tragedy was

a) Methyl isocyanate
b) Potassium isothiocyanate
c) Sodium isothiocyanate
d) Ethyl isothiocyanate

67. Which kind of defect is shown by the given crystal?

$K^+\ Cl^-K^+\ Cl^-K^+\ Cl^-$

$Cl^-\square Cl^-K^+\square K^+$

$K^+Cl^-\square\ Cl^-K^+Cl^-$

$Cl^-K^+Cl^-K^+\square\ K^+$

a) Schottky defect
b) Frenkel defect
c) Schottky and Frenkel defects
d) Substitution disorder

68. Which one of the following defects in the crystals lowers its density?

a) Frenkel defect
b) Schottkydefect

c) F-centres d) Interstitial defect

69. A solution is prepared by dissolving 24.5 g of sodium hydroxide in distilled water to give 1L solution. The molarity of NaOH in the solution is
(Given, that molar mass of NaOH= $40.0\ g\ mol^{-1}$)

a) 0.2450 M b) 0.6125 M

c) 0.9800 M d) 1.6326 M

70. The solubility of a gas increases in a liquid with

a) Decrease in temperature

b) Increases in temperature

c) Reduction of gas pressure

d) Amount of liquid taken

71. Which of the following reactions cannot be Abase for electrochemical cell?

a) $H_2 + O_2 \longrightarrow H_2O$

b) $AgNO_3 + Zn \rightarrow Zn(NO_3)_2 + Ag$

c) $AgNO_3 + NaCl \rightarrow AgCl\downarrow + NaNO_2$

d) $KMnO_4 + FeSO_4 + H_2SO_4 \longrightarrow K_2SO_4 + Fe_2(SO_4)_3 + MnSO_4 + H_2O$

72. Half-life of two samples is 0.1 and 0.8 s. Their respective concentration is 400 and 50 respectively.
The order of reaction is

a) 0 b) 2 c) 1 d) 4

73. The rate for the reaction, $RCl + NaOH(aq) \rightarrow ROH + NaCl$ is given by rate =k[RCl],the freezing point of the reaction is

a) Unaffected by increasing the temperature of the reaction

b) Decreased on increasing the temperature of the reaction

c) Halved on reducing the concentration of RCl to half

d) Doubled on doubling the concentration of NaOh

74. Which of the following is not a property of colloidal solution?

a) Heterogeneity

b) Particle size $>$ 100 mm

c) Tyndall effect

d) Brownian movement

75. A metal which is refined by poling is

a) Silver
b) Sodium
c) Blister copper
d) Zinc

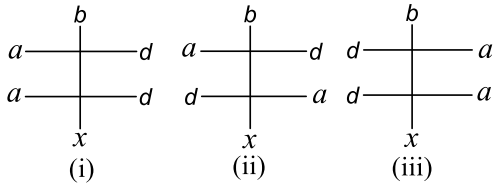
76. The forth-floatation process is based upon
a) The difference in the specific gravity of ore and gangue particles
b) The magnetic properties of gangue and ore
c) Preferential wetting of gangue perticles by oil
d) The solubility of ore particles in suitable regent

77. Nitrogen dioxide
a) Does not dissolve in water
b) Dissolves in water forming nitric acid
c) Dissolves in water to form a mixture of nitrous and nitric acid
d) Dissolves in water to form nitrous acid and gives off oxygen

78. In context of the lanthanoids, which of the following statements is not correct?
a) There is a gradual decrease in the radii of the members with increasing atomic number in the series.
b) All the members exhibit $+3$ oxidation state.
c) Because of similar properties the separation of lanthanoids is not easy.
d) A vailability of $4f$-electrons results in the formation of compounds in $+4$ state for all members of the series.

79. Among Sc(III), Ti(IV), Pd(II) and Cu(II) ions
a) All are paramagnetic
b) All are diamagnetic
c) Sc (III), Ti (IV) are paramagnetic and Pd(II), Cu(II) are diamagnetic
d) Sc (III), Ti (IV) are diamagnetic and Pd(II), Cu(II) are paramagnetic

80. Which of the following is/are threo isomers?



a) Only (i)
b) Only (ii)
c) Only (iii)
d) All (i), (ii) and (iii)

81. Wurtz's reaction involves the reduction of alkyl halide with
a) Zn/HCl
b) HI
c) Zn/Cu couple
d) Na in ether

82. In the reaction,

$CH_3OH \xrightarrow{\text{Oxidation}} A \xrightarrow{NH_3} B$; A and B are

a) $HCHO, HCOONH_4$ b) $HCOOH, HCOONH_4$

c) $HCOOH, HCONH_2$ d) $HCHO, HCONH_2$

83. The end product of which of the following reaction is isomer of alcohols?

a) $C_2H_4 \xrightarrow{B_2H_6} A \xrightarrow[NaOH]{H_2O_2} B$

b) $CHI_3 \xrightarrow[\Delta]{Ag} A \xrightarrow[Hg^{2+}]{\text{Dil } H_2SO_4} B \xrightarrow{\text{Reduction}} C$

c) $C_2H_4 \xrightarrow{HI} A \xrightarrow{\text{Aqueous KOH}} B \xrightarrow[140°C]{\text{Conc.}H_2SO_4} C$

d) $CH_3MgBr \xrightarrow{CH_2O} A \xrightarrow{H_2O} C$

84. When CH_3COOH reacts with $CH_3 - MgX$

a) CH_3COX is formed

b) Hydrocarbon is formed

c) Acetone is formed

d) Alcohol is formed

85. Acetonitriles on hydrolysis produce which of the following?

a) Amine b) Acid

c) Amides d) Carbonyl compounds

86. During diazotization of benzenamine with sodium nitrite and hydrochloric acid, the excess of hydrochloric acid is used primarily to

a) Check the hydrolysis of $\phi - OH$

b) Ensure a stoichiometric amount of nitrous acid

c) Check the concentration of free aniline

d) Neutralize any base formed during reaction

87. When glucose reacts with bromine water the main product is

a) Acetic acid b) Saccharic acid

c) Glyceraldehydes d) Gluconic acid

88. Bakelite is an example of

a) Elastomer

b) Fibre

c) Thermoplastic

d) Thermosetting polymer

89. The polymer melmac is obtained by

a) Addition polymerization of melamine and formaldehyde

b) Free radical polymerisation of acrylonitrile

c) Condensation polymerization of melamine and formaldehyde

d) Coordination polymerisation of melamine

90. Which of the following statement is not true about the drug barbital?

a) It causes addiction

b) It is a non-hypnotic drug

c) It is tranquillizer

d) It is used insleeping pills