

43. A transistor is used as an amplifier in CB mode with a load resistance of $5k\Omega$ the current gain of amplifier is 0.98 and the input resistance is 70Ω , the voltage gain and power gain respectively are
 1) 70, 68.6 2) 80, 75.6 3) 60, 66.6 4) 90, 96.6
44. If A and B two inputs in AND gate, then AND gate has an output of 1 when the values of A and B are
 1) A=0, B=0 2) A=1, B=1 3) A=1, B=0 4) A=0, B=1
45. Out of the following options which one can be used to produce a propagating electromagnetic wave?
 1) A charge moving at constant velocity 2) A stationary charge
 3) A charge less particle 4) An accelerating charge

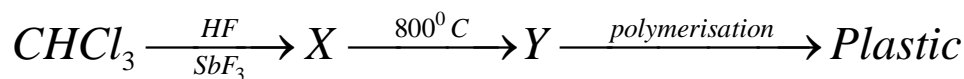
CHEMISTRY

46. Specific volume of cylindrical virus particles is $6.02 \times 10^{-2} \text{ cc/g}$ whose radius and length $7A^0$ and $10A^0$, If $N_A = 6.02 \times 10^{23}$ find molecular weight of virus
 1) $3.08 \times 10^3 \text{ kg/mol}$ 2) 15.4 kg/mol 3) $15.4 \times 10^4 \text{ kg/mol}$ 4) $3.08 \times 10^4 \text{ kg/mol}$
47. Which transition is Li^{+2} would have the same wavelength as the $2 \rightarrow 4$ transition is He^+ ion?
 1) $4 \rightarrow 2$ 2) $2 \rightarrow 4$ 3) $3 \rightarrow 6$ 4) $6 \rightarrow 2$
48. Pressure of a mixture of 4g of O_2 and 2g of H_2 confined in a bulb of 1 litre at $0^\circ C$ is
 1) 25.184 atm 2) 31.205 atm 3) 45.215 atm 4) 15.210 atm
49. Which of the following exhibits weakest inter molecular forces
 1) NH_3 2) HCl 3) He 4) H_2O
50. If x_1, x_2 & x_3 are enthalpies of H-H, O=O and O-H bonds respectively and x_4 is the enthalpy of vaporization of water, estimate the standard enthalpy of combustion of hydrogen?
 1) $x_1 + \frac{x_2}{2} - 2x_3 + x_4$ 2) $x_1 + \frac{x_2}{2} - 2x_3 - x_4$ 3) $x_1 + \frac{x_2}{2} - x_3 - x_4$ 4) $2x_3 - x_1 - \frac{x_2}{2} - x_4$
51. Which of the following on the addition will cause deep red colour to disappear.

$$\underset{\text{Pale yellow}}{Fe_{(aq)}^{+3}} + \underset{\text{Colour less}}{SCN_{(aq)}^-} \rightleftharpoons \underset{\text{Deep red}}{[Fe(SCN)]_{(aq)}^{+2}}$$
 a) KSCN b) $HgCl_2$ c) $H_2C_2O_4$
 1) a, b & c 2) a & b only 3) b & c only 4) a & c only
52. Which of the following are not state functions?
 I) $q+w$ II) q III) w IV) H-Ts
 1) II, III & IV 2) I, II & III 3) II & III 4) I & IV
53. 30 CC of $\frac{M}{3} HCl$, 20 CC of $\frac{M}{2} HNO_3$ and 40CC of $\frac{M}{4} NaOH$ solutions are mixed and the volume was made up to 1 dm^3 . Then pH of the resulting solution is :
 1) 1 2) 2 3) 3 4) 8
54. Mercury is the only metal which is liquid at $0^\circ C$. This is due to
 1) very high ionization energy and weak metallic bond
 2) Low ionization energy
 3) high atomic weight 4) high vapour pressure
55. Which substance does not speed up decomposition of H_2O_2 ?
 1) glycerol 2) Pt 3) gold 4) MnO_2
56. For alkali metals, which one of the following trends is incorrect
 1) Hydration enthalpy : $Li^+ > Na^+ > K^+ > Rb^+$ 2) Ionisation energy : $Li > Na > K > Rb$
 3) Density : $Li < Na < K < Rb$ 4) Atomic size : $Li < Na < K < Rb$

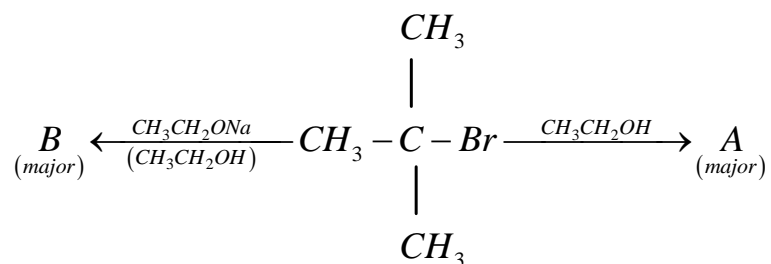
57. Which one of the following statements about the zeolite is false
 1) They are used as cation exchangers
 2) They have open structure which enables them to take up small molecules
 3) Zeolites are alumina silicates having three dimensional network
 4) Some of the SiO_4^{-4} units are replaced by AlO_4^{-5} and AlO_6^{-9} ions in Zeolits.
58. The chemical entities present in thermosphere of atmosphere are
 1) $\text{O}^{+2}, \text{O}^+, \text{NO}^+$ 2) O_3 3) $\text{N}_2, \text{O}_2, \text{CO}_2, \text{H}_2\text{O}$ 4) $\text{O}_3, \text{O}_2^+, \text{O}_2$
59. Which is expected to show paramagnetism?
 1) ClO_2 2) SO_2 3) CO_2 4) SiO_2
60. The bond order in CO_3^{-2} ion between C-O is
 1) Zero 2) 0.88 3) 1.33 4) 2
61. Which is the best description of behaviour of bromine in the reaction given below?
 $\text{H}_2\text{O} + \text{Br}_2 \rightarrow \text{HOBr} + \text{HBr}$
 1) Proton acceptor only 2) both oxidized and reduced
 3) Oxidized only 4) reduced only
62. One mole of CaOCl_2 is dissolved in water & excess of KI added. Then hypo ($\text{Na}_2\text{S}_2\text{O}_3$) required to react with the oxidised product completely is
 1) 1 mole 2) 2 moles 3) 1.5 moles 4) 2.5 moles
63. An organic compound containing C, H & N have the percentage 40, 13.33 & 46.67. Its empirical formula may be
 1) $\text{C}_2\text{H}_7\text{N}$ 2) $\text{C}_2\text{H}_7\text{N}_2$ 3) CH_4N 4) CH_5N
64. How will you separate a solution of benzene + CHCl_3
 1) Sublimation 2) Filtration 3) Distillation 4) Crystallization
65. The relative extent to which the various orbitals penetrate the electron clouds of other orbitals is
 1) $s > p > d > f$ 2) $f > d > p > s$ 3) $p > s > d > f$ 4) $d > f > p > s$
66. A metal has an FCC latticed. The edge length of the unit cell is 404 pm. The density of the metal is 2.72 gm. cm^{-3} . The molar mass of the metal is
 1) 30 g mol^{-1} 2) 27 g mol^{-1} 3) 20 g mol^{-1} 4) 40 g mol^{-1}
67. The vapour pressure of benzene at a certain temperature is 640 m of Hg. A non-volatile and non-electrolyte solid weighing 2.175 g is added to 39.08 g of benzene. The vapour pressure of the solution is 600 m of Hg. What is the molecular weight of solid substance?
 1) 49.50 2) 59.6 3) 69.5 4) 79.8
68. For the inversion of cane sugar, the order and molecularity values respectively are
 1) 2 and 2 2) 1 and 2 3) 1 and 1 4) 2 and 1
69. Consider the half-cell reduction reaction
 $\text{Mn}^{+2} + 2e^- \rightarrow \text{Mn}, E^0 = -1.18\text{V}$
 $\text{Mn}^{+2} \rightarrow \text{Mn}^{+3} + e^-, E^0 = -1.51\text{V}$
 The E^0 for the reaction $3\text{Mn}^{+2} \rightarrow \text{Mn} + 2\text{Mn}^{+3}$ and possibility of the forward reaction are
 1) -2.69V and no 2) -4.18V and yes
 3) +0.33V and yes 4) +2.69V and no
70. For a first order reaction, the half-life period is independent of
 1) Initial concentration 2) cube root of initial concentration
 3) first power of final concentration 4) square root of final concentration
71. A liquid aerosol is a colloidal system of
 1) a liquid dispersed in a solid 2) a liquid dispersed in a gas
 3) a gas dispersed in a liquid 4) a solid dispersed in a gas
72. Thomas slag is
 1) CaSiO_3 2) $\text{Ca}_3(\text{PO}_4)_2$ 3) MnSiO_3 4) CaCO_3

73. Which of the following after burning at room temperature gives gaseous oxide?
 1) H 2) Na
 3) S 4) He
74. Which noble gas is most soluble in water?
 1) He 2) Ar 3) Ne 4) Xe
75. Which one of the following compounds is not colored?
 1) $Na_2[CuCl_4]$ 2) $Na_2[CdCl_4]$
 3) $K_4[Fe(CN)_6]$ 4) $K_3[Fe(CN)_6]$
76. Which of the following is more basic in nature
 1) $La(OH)_3$ 2) $Gd(OH)_3$
 3) $Pm(OH)_3$ 4) $Lu(OH)_3$
77. In the complex $Fe(CO)_x$ the value of x is and it is
 1) 3, octahedral 2) 4, tetrahedral
 3) 5, trigonal pyramidal 4) 6, square pyramidal
78. A magnetic moment 1.73 B.M will be shown by one among the following
 1) $[Ni(CN)_4]^{-2}$ 2) $TiCl_4$
 3) $[COCl_6]^{-4}$ 4) $[Cu(NH_3)_4]^{+2}$
79. Lysine is least soluble in water in the P^H range
 1) 3 to 4 2) 5 to 6 3) 6 to 7 4) 8 to 9
80. Which one of the following is used to make non-stick cookware?
 1) PVC 2) Polystyrene
 3) Polyethylene terephthalate 4) poly tetra fluoro ethene
81. The ligands in anti-cancer drug cisplatin are
 1) NH_3, Cl 2) NH_3, H_2O
 3) Cl, H_2O 4) NO, Cl
82. Which plastic is obtained from $CHCl_3$ in the following reaction?



- 1) Bakelite 2) Polythene 3) Teflon 4) Perspex

83.



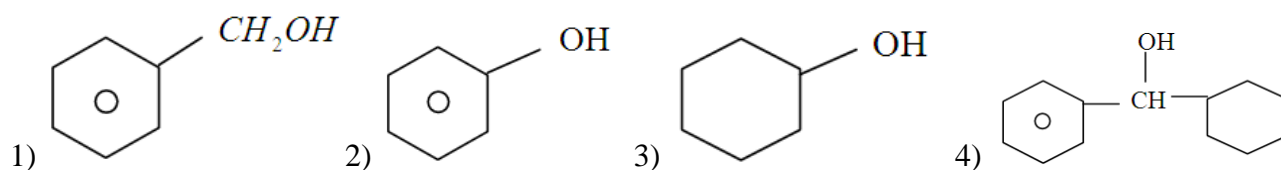
A and B are

- 1) $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 - \text{C} - \text{OCH}_2\text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$ in both cases
- 2) $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 - \text{C} = \text{CH}_2 \end{array}$ in both cases
- 3) $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 - \text{C} - \text{OCH}_2\text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$ and $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 - \text{C} \\ || \\ \text{CH}_2 \end{array}$
- 4) $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 - \text{C} \\ || \\ \text{CH}_2 \end{array}$ and $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 - \text{C} - \text{OCH}_2\text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$

84. Which of the following exhibits linkage isomerism

- 1) $[\text{Co}(\text{NH}_3)_5\text{Br}]\text{SO}_4$ 2) $[\text{Co}(\text{NH}_3)_5\text{NO}_2]\text{Cl}_2$
 3) $[\text{Cr}(\text{H}_2\text{O})_6]\text{Cl}_3$ 4) $[\text{Co}(\text{NH}_3)_6][\text{Cr}(\text{CN})_6]$

85. Which of the following compounds has the most acidic nature?



86. $\text{CH}_3\text{CH}_2\text{COOH} \xrightarrow{\text{SOCl}_2} \text{B} \xrightarrow{\text{NH}_3} \text{C} \xrightarrow[\text{Br}_2]{\text{KOH}} \text{D}$ the structure of D is

- 1) $\text{CH}_3\text{CH}_2\text{NHCH}_3$ 2) $\text{CH}_3\text{CH}_2\text{NH}_2$ 3) $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ 4) $\text{CH}_3\text{CH}_2\text{CONH}_2$

87. Organic compound A of the molecular formula $\text{C}_5\text{H}_{10}\text{Cl}_2$ is hydrolysed to compound B $\text{C}_5\text{H}_{10}\text{O}$, which gives an oxime with hydroxylamine and yellow ppt with a mixture of iodine and sodium hydroxide. The compound A should be

- 1) $\text{CH}_3\text{CH}_2\text{CCl}_2\text{CH}_2\text{CH}_3$ 2) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CCl}_2\text{CH}_3$
 3) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CHCl}_2$ 4) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHClCH}_2\text{Cl}$

88. Cyanohydrin of which of the following forms lactic acid

- 1) $\text{CH}_3\text{CH}_2\text{CHO}$ 2) HCHO 3) CH_3CHO 4) CH_3COCH_3

89. Which of the following is more basic than aniline?

- 1) p-nitro aniline 2) benzyl amine 3) Di phenyl amine 4) Tri phenyl amine

90. Which of the following will be most stable diazomium salt RN_2^+X^- ?

- 1) $\text{C}_6\text{H}_5\text{N}_2^+\text{X}^-$ 2) $\text{CH}_3\text{N}_2^+\text{X}^-$ 3) $\text{CH}_3\text{CH}_2\text{N}_2^+\text{X}^-$ 4) $\text{C}_6\text{H}_5\text{CH}_2\text{N}_2^+\text{X}^-$

BIOLOGY

91. Two organisms belongs to same class but not in the same family belongs to same _____

- 1) genus 2) species 3) variety 4) order