JEE MAIN - 2014

CHEMISTRY

61. Which one is classified as a condensation polymer ?

(A) Acrylonitrile

(B) Dacron

(C) Neoprene

(D) Teflon

62. Which one of the following properties is **not** shown by NO ?

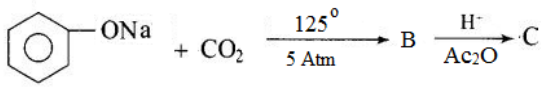
(A) It's bond order is 2.5

(B) It is diamagnetic gaseous state

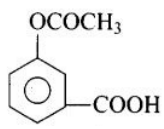
(C) It is a neutral oxide

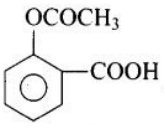
(D) It combines with oxygen to form nitrogen dioxide

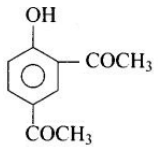
63. Sodium phenoxid when heated with CO_2 under pressure at $125°C$ yields a product which on acetylation produces C .

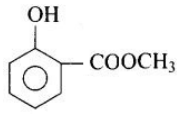


The major product C would be:

(1) 

(2) 

(3) 

(4) 

64. Given below are the half –cell reactions:

$Mn^{2+} + 2e^- \rightarrow Mn; E° = 1.18\,V$

$2\left(Mn^{3+} + e^- \rightarrow Mn^{2+}\right); E° = +1.51\,V$

The $E°$ for $3Mn^{2+} \rightarrow Mn + 2Mn^{3+}$ will be:

(1) –0.33 V; the reaction will occur

(2) –2.69 V; the reaction will not occur

(3) –2.69 V; the reaction will occur

(4) –0.33 V; the reaction will not occur

65. For complete combustion of ethanol, $C_2H_5OH(l) + 3O_2(g) \rightarrow 2CO_2(g) + 3H_2O(l)$, the bomb calorimeter, is 1364.47 kJ mol^{-1} at 25°C. Assuming ideality the Enthalpy of combustion, $\Delta_c H$, for the reaction will be:

$\left(R = 8.314\,kJ\,mol^{-1}\right)$

(1) –1350.50 kJ mol^{-1}

(2) –1366.95 kJ mol^{-1}

(3) –1361.95 kJ mol^{-1}

(4) –1460.50 kJ mol^{-1}

66. For the estimation of nitrogen, $1.4\,g$ of an organic compound was digested by Kjeldahl method and the evolved ammonia was absorbed in $60\,mL$ of $\frac{M}{10}$ sulphuric acid. The unreacted acid required $20\,mL$ of $\frac{M}{10}$ sodium hydroxide for complete neutralization. The percentage of nitrogen in compound is:

(1) 5%

(2) 6%

(3) 10%

(4) 3%

67. The major organic compound formed by the reaction of $1,1,1-$ trichloroethane with silver power is:

(1) $2-$Butene

(2) Acetylene

(3) Ethene

(4) $2-$Butene

68. The ratio of masses of oxygen and nitrogen in a particular gaseous mixture is, $1:4$. The ratio of number of their molecule is :

(1) $3:16$

(2) $1:4$

(3) $7:32$

(4) $1:8$

69. The metal that cannot be obtained by electrolysis of an aqueous solution of its salts is :

(1) Cr

(2) Ag

(3) Ca

(4) Cu

70. The equivalent conductance of $NaCl$ at concentration C and at infinite dilution are ${}^{\lambda}C$ and ${}^{\lambda}\infty$, respectively. The correct relationship between ${}^{\lambda}C$ and ${}^{\lambda}\infty$ is given as :

(where the constant B is positive)

(1) $\lambda_C = \lambda_\infty + (B)\sqrt{C}$

(2) $\lambda_C = \lambda_\infty + (B)C$

(3) $\lambda_C = \lambda_\infty - (B)C$

(4) $\lambda_C = \lambda_\infty - (B)\sqrt{C}$

71. The correct set of four quantum numbers for the valence electrons of rubidium atom $(Z = 37)$ is:

(1) $5, 0, 1, +\frac{1}{2}$

(2) $5, 0, 0, +\frac{1}{2}$

(3) $5, 1, 0, +\frac{1}{2}$

(4) $5, 1, 1, +\frac{1}{2}$

72. Consider separate solutions of $0.500M$ $C_2H_5OH(aq), 0.100\,M\,Mg_3(PO_4)_2(aq), 0.250\,M\,KBr(aq)$ and $0.125\,M\,Na_3PO_4(aq)$ at $25°C$. Which statement is **true** about these solution, assuming all salts to be strong electrolytes?

(1) $0.500M\ C_2H_5OH(aq)$ has the highest osmotic pressure.

(2) They all have the same osmotic pressure.

(3) $0.100\,M\,Mg_3(PO_4)_2(aq)$ has the highest osmotic pressure.

(4) $0.125\,M\,Na_3PO_4(aq)$ has the highest osmotic pressure.

73. The most suitable reagent for the conversion of $R-CH_2-OH \rightarrow R-CHO$

(1) PCC (Pyridinium Chlorochromate)

(2) $KMnO_4$

(3) $K_2Cr_2O_7$

(4) CrO_3

74. CsCl crystallises in body centred cubis lattice. If ''*a*' is its edge length then which of the following expressions is correct ?

(1) $r_{Cs^+} + r_{Cl^-} = \sqrt{3}a$

(2) $r_{Cs^+} + r_{Cl^-} = 3a$

(3) $r_{Cs^+} + r_{Cl^-} = \frac{3a}{2}$

(4) $r_{Cs^+} + r_{Cl^-} = \frac{\sqrt{3}}{2}a$

75. In which of the following reactions H_2O_2 acts as a reducing agent ?

(a) $H_2O_2 + 2H^+ - 2e^- \rightarrow 2H_2O$

(b) $H_2O_2 - 2e^- \rightarrow O_2 + 2H$

(c) $H_2O_2 + 2e^- \rightarrow 2HO$

(d) $H_2O_2 + 2HO^- - 2e^- \rightarrow O_2 + 2H_2O$

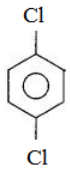
(1) $(b),(d)$

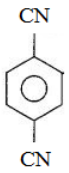
(2) $(a),(b)$

(3) $(c),(d)$

(4) $(a),(c)$

76. For which of the following molecule significant $\mu \neq 0$?

(a) 

(b) 

(c) 

(d) 

(1) (c) and (d)

(2) only (a)

(3) (a) and (b)

(4) only (c)

77. On heating an aliphatic primary amine with chlooroform and ethanolic potassium hydroxide, the organic compound formed is:

(A) an alkyl isocyanide

(B) an alkanol

(C) an alkanediol

(D) an alkyl cyanid

78. In S_N2 reactions, the correct order of reactivity for the following compounds $CH_3Cl > CH_3CHCl, (CH_3)_2CHCl$ and $(CH_3)_3CCl$ is

(1) $(CH_3)_2CHCl > CH_3CH_2Cl > CH_3Cl > (CH_3)_3CCl$

(2) $CH_3Cl > (CH_3)_2CHCl_3 > CH_3CH_2Cl > (CH_3)_3CCl$

(3) $CH_3Cl > CH_3CH_2Cl > (CH_3)_2CHCl > (CH_3)_3CCl$

(4) $CH_3CH_2Cl > CH_3Cl > (CH_3)_2CHCl > (CH_3)_3CCl$

79. The octahedral complex of a metal ion M^{3+} with four monodentate ligands L_1, L_2, L_3 and L_4 absorb wavelengths in the region of red, green, yellow and blue, respectively. The increasing order of ligand strength of the four ligands is

(1) $L_1 < L_2 < L_4 < L_3$

(2) $L_4 < L_3 < L_2 < L_1$

(3) $L_1 < L_3 < L_2 < L_4$

(4) $L_3 < L_2 < L_4 < L_1$

80. The equation which is balanced and represents the correct product(s) is:

(1) $CuSO_4 + 4KCN \rightarrow K_2\left[Cu(CN)_4\right] + K_2SO_4$

(2) $Li_2O + 2KCl \rightarrow 2LiCl + K_2O$

(3) $\left[CoCl(NH_3)_5\right]^+ + 5H^+ \rightarrow Co^2 + 5NH_4^+ + Cl^-$

(4) $\left[Mg(H_2O)_6\right]^2 + (EDTA)^{4-} \xrightarrow{\text{excess NaOH}} \left[Mg(EDTA)\right]^2 + 6H_2O$

81. In the reaction, $CH_3COOH \xrightarrow{LiAlH_4} A \xrightarrow{PCl_5} B \xrightarrow{Alc.KOH}$,

The product C is :

(1) Acetyl chloride

(2) Acetaldehyde

(3) Acetylene

(4) Ethylene

82. The Correct statement for the molecule, CsI_3, is:

(1) it contains Cs^+, I^- and I_2 lattice molecule.

(2) it is a covalent molecule.

(3) it contains Cs^+, I^- and I_3^- ions.

(4) it contains Cs^+, I^- and I^- ions.

83. For the reaction $SO_{2(g)} + \frac{1}{2}O_{2(g)} \rightleftharpoons SO_{2(g)}$, if $K_P = K_C(RT)^x$ where the symbols have usual meaning then the value of x is: (assuming ideality)

(1) 1

(2) -1

(3) $-\frac{1}{2}$

(4) $\frac{1}{2}$

84. For the non-stoichiometre reaction $2A + B \rightarrow C + D$, the following kinetic data were obtained in three separate experiments, all at $298\,K$.

Initial Concentration (A)	Initial Concentration (B)	Initial rate of formation of $C\left(mol\,L^{-}S^{-}\right)$
$0.1M$	$0.1M$	1.2×10^{-3}
$0.1M$	$0.2M$	1.2×10^{-3}
$0.2M$	$0.1M$	2.4×10^{-3}

The rate law for the formation of C is :

(1) $\frac{dc}{dt} = k[A]$

(2) $\frac{dc}{dt} = k[A][B]$

(3) $\frac{dc}{dt} = k[A]^2[B]$

(4) $\frac{dc}{dt} = k[A][B]^2$

85. Resistance of $0.2M$ solution of an electrolyte is 50Ω .The specific conductance of the solution is $1.4 S\,m^{-1}$ The resistance of $0.5M$ solution of the same electrolyte is 280Ω . The molar conductivity of $0.5M$ solution of the electrolyte in $S m^2 mol^{-1}$ is:

(1) 5×10^{2}

(2) 5×10^{-4}

(3) 5×10^{-3}

(4) 5×10^{3}

86. Among the following oxoacids, the correct decreasing order of acid strength is :

(1) $HClO_2 > HClO_4 > HClO_3 > HOCl$

(2) $HOCl > HClO_2 > HClO_3 > HOCl_4$

(3) $HClO_4 > HOCl > HClO_2 > HClO_3$

(4) $HClO_4 > HClO_3 > HClO_2 > HOCl$

87. Which one of the following bases is not present in DNA ?

(1) Thymine

(2) Quinoline

(3) Adenine

(4) Cytosine

88. Considering the basic strength of amines in aqueous solution, which one has the smallest pKb value?

(1) $C_6H_5NH_2$

(2) $(CH_3)_2NH$

(3) CH_3NH_2

(4) $(CH_3)_3N$

89. If Z is a compressibility factor van der Waals equation at low pressure can be written as:

(1) $Z = 1 + \frac{Pb}{RT}$

(2) $Z = 1 + \frac{RT}{Pb}$

(3) $Z = 1 - \frac{a}{VRT}$

(4) $Z = 1 - \frac{Pb}{RT}$

90. Which series of reaction correctly represents chemical relation related to iron and its compound ?

(1) $Fe \xrightarrow{O_2,\text{heat}} Fe_3O_4 \xrightarrow{CO,600°C}$
$FeO \xrightarrow{CO,700°C} Fe$

(2) $Fe \xrightarrow{\text{dil}\,H_2SO_4} FeSO_4 \xrightarrow{H_2SO_4,O_2}$
$Fe_2(SO_4)_3 \xrightarrow{\text{heat}} Fe$

(3) $Fe \xrightarrow{O_2,\text{heat}} FeO \xrightarrow{\text{dil}\,H_2SO_4}$
$FeSO_4 \xrightarrow{\text{heat}} Fe$

(4) $Fe \xrightarrow{Cl_2,\text{heat}} FeCl_3 \xrightarrow{\text{heat,air}}$
$Fe_2Cl_2 \xrightarrow{Zn} Fe$