46. X and Y are two crystalline substances both having cubic unit cells. The ratio of molecular masses is 1 : 2. The ratio of 'a' parameters is 1 : 2. The ratio of number of formula units (Z) is 1 : 4. The ratio of their densities is

1) 4 : 1 2) 1 : 1 3) 1 : 2 4) 1 : 4

47. The complex $\left[Co\left(NH_3\right)_6\right]^{3+}$ is an inner orbital complex whereas the $\left[CoF_6\right]^{3-}$ is an outer orbital complex. The number of unpaired electrons in these two complexes are respectively

1) Zero and 4 2) 4 and 4 3) 6 and 2 4) 3 and 4

48. A hydrocarbon with molecular formula C_4H_6 reacts with bromine readily and gives a red precipitate with ammoniacal Cu_2Cl_2. On treatment with dilute H_2SO_4 Containing $HgSO_4$ gives 2- butanone. The hydrocarbon is

1) 2- Butyne 2) 1 – Butene 3) 1- butyne 4) Cyclobutene

49. In $C \underset{}{\overset{a}{-}} C = C \underset{}{\overset{b}{-}} C = C \underset{}{\overset{c}{-}} C \underset{}{\overset{d}{-}} C$, the strongest C - C single bond is

1) b 2) a 3) c 4) d

50. One molal solution of K_x [Fe $(CN)_6$] is isotonic with 4 molal urea solution. The degree of dissociation of potassium Iron cyanide is one. Then the value of 'x' is

1) 4 2) 3 3) 2 4) 1

51. The standard potential for the electrode MnO_4^- / MnO_2 in solution is

Given $E^o_{MnO_4^-/Mn^{+2}} = 1.51V$ and $E^o_{MnO_2/Mn^{+2}} = 1.23V$

1) - 1.70 V 2) + 1.1 V 3) + 1.70 V 4) - 1.1V

52. The limiting molar conductivities Λ^0 for NaCl, KBr and KCl are 126, 152 and 150Scm^2 mol^{-1} respectively. The ^{0} for NaBr is :

1) 278 S cm^2 mol^{-1} 2) 176 S cm^2 mol^{-1} 3) 128 S cm^2 mol^{-1} 4) 302 S cm^2 mol^{-1}

ROUGH

53. $NaCl \xrightarrow[T_1]{H_2SO_4} NaHSO_4 \xrightarrow[T_2]{NaCl} Na_2SO_4$**. Correct statement is**

1) HCl is obtained in both steps 2) $T_1 < T_2$

3) HCl is dried using conc H_2SO_4 4) All of these

54. Number of configurational isomers for $(CH_3)_2 CH.CH.Cl.CH = CHCl$

1) 2 2) 3 3) zero 4) 4

55. Emf of the cell Pt , H_2 (1 atm) / H^+ (0.01) // Cl_2(1atm) / Cl^- (0.1M) , Pt . Given E° **of** $Cl_2/Cl^- = 1.36V$

1) + 1.36V 2) + 1.54V 3) + 1.48V 4) + 1.12V

56. The electron affinity values of 3rd period elements A, B, C and D are respectively -135, -60, -200 and $-348\,KJ\,mole^{-1}$**. The outer configuration of element 'B' is**

1) $3s^2\ 3p^1$ 2) $3s^2\ 3p^4$ 3) $3s^2\ 3p^3$ 4) $3s^2\ 3p^2$

57. In a face centered cubic lattice, atom 'A' occupies the corner positions and atom 'B' occupies the face center positions. If one atom of B is missing from one of the face centered points. The formula of the compound is

1) A_2B 2) A_2B_5 3) AB_2 4) A_2B_2

58. In the roasting of iron pyrites, equivalent weight of iron pyrites is

1) $\frac{M}{11}$ 2) $\frac{11M}{10}$ 3) $\frac{M}{6}$ 4) $\frac{6M}{5}$

59. $CH_2 = CH - CH(Br) - CH_3 \xrightarrow{\text{alc.KOH}} X(\text{major})$**. 'X' is**

1) $CH_2 = C = CH - CH_3$ 2) $CH_2 = CH - CH = CH_2$

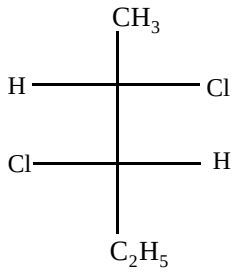
3) $CH_3 - CH = CH - CH_3$ 4) $CH_2 = CH - CH_2 - CH_3$

60. Bond length and bond angle in ozone molecule is/are

1) 119°, 121pm 2) 117°, 148pm 3) 117°, 128pm 4) 111°, 128pm

ROUGH

61. Absolute configuration of



1) 2S, 3R 2) 3R, 2S 3) 2R, 3R 4) 2S, 3S

62. 'X' along with liquid oxygen provide a tremendous thrust in rockets. Oxidation state of nitrogen in 'X' is

1) - 2 2) - 3 3) - 1 4) + 1

63. The number of $p\pi - d\pi$ bonds present in XeO_3 and XeO_4 molecules respectively

1) 3, 4 2) 4, 2 3) 2, 3 4) 3, 2

64. 1, 3 butadiene and styrene on polymerisation give

1) Bakelite 2) Terylene 3) Buna - S 4) Teflon

65. To a 25ml H_2O_2 solution, excess acidified solution of KI is added. The iodine liberated required 20ml of 0.3M $Na_2S_2O_3$ solution. Strength of H_2O_2 solution is

1) 1.344 gr/litre 2) 3.244 gr/litre 3) 5.4 gr/litre 4) 4.08 gr/litre

66. The gas evolved on heating $(NH_4)_2Cr_2O_7$ is

1) NH_3 2) N_2 3) N_2O 4) O_2

67. When HNO_3 oxidizes I_2, the change in oxidation number of iodine is

a) 0 to + 4 2) 0 to -5 3) 0 to +5 4) 0 to +3

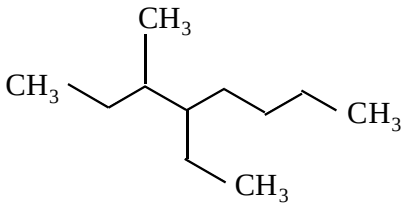
68. Gabriel phthalimide synthesis is used for the preparation of

a) Primary aromatic amine 2) Primary aliphatic amine

c) Secondary amine 4) Tertiary amine

ROUGH

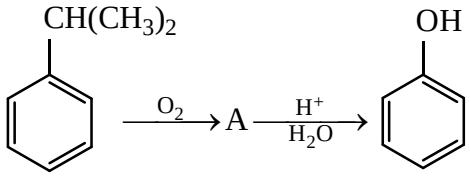
69. Name of the compound given below



1) 5 - ethyl - 6 - methyl octane
2) 4 - ethy l - 3 - methyl octane
3) 3 - methyl - 4 ethyl octane
4) 2, 3 diethyl heptane

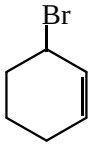
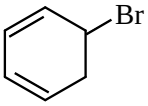
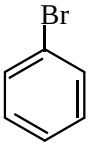
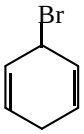
70. An alkene on ozonolysis gives isobutyraldehyde only. The alkene is

1) 2, 5 dimethyl hex - 3 ene
2) 3, 4 dimethyl hex - 3 ene
3) 2, 3 dimethyl but - 2 ene
4) 3 methyl pent - 1 - ene

71.  **. 'B' in the above sequence of reaction is**

1) CH_3CHO
2) CH_3COCH_3
3) CH_3COOH
4) $CH_3CHOHCH_3$

72. Which of the following is fast dehydro brominated

1) 
2) 
3) 
4) 

73. Grignard reagent + $CdCl_2$ $\longrightarrow$ A + $MgCl_2$

A + B $\longrightarrow$ Butanone + $CdCl_2$

A and B are respectively

1) $(CH_3)_2Cd$ & C_2H_5COCl
2) CH_3MgCl & C_2H_5Cl
3) $(C_2H_5)_2Cd$ & CH_3Cl
4) CH_3COCl & $(C_2H_5)_2Cd$

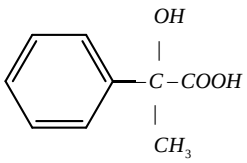
ROUGH

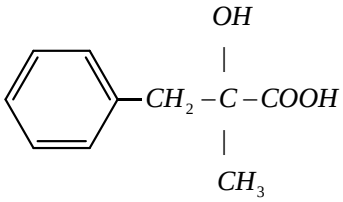
74. A steel cylinder of 8 lit capacity contains H_2 gas at 12 atm. At the same temperature, how many cycle tubes of 4*l* capacity at 2 atm pressure can be filled by this gas ?

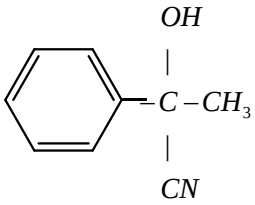
1) 12 2) 5 3) 10 4) 15

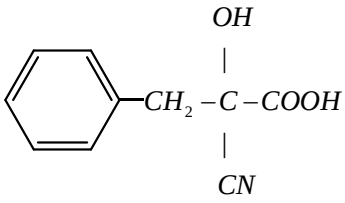
75. $CH_3COOH \xrightarrow{SOCl_2} A \xrightarrow[anhyd.AlCl_3]{Benzene} B \xrightarrow{HCN} C \xrightarrow{H_2O} D$

In the following sequence of reactions, acetic acid yields D. The structure of 'D' is

1) 

2) 

3) 

4) 

76. Which of the following cannot undergo disproportionation ?

1) ClO^- 2) ClO_2^- 3) ClO_3^- 4) ClO_4^-

77. Balance the following equation by oxidation number method

$Cr_{(s)} + Pb(NO_3)_{2(aq)} \longrightarrow Cr(NO_3)_3 + Pb_{(s)}$, the coefficients of species in balanced reaction :

1) 3, 2, 3, 2 2) 2, 3, 2, 3 3) 2, 2, 3, 3 4) 3, 3, 2, 2

78. On passing H_2S gas into a solution containing both Cu^{2+} and Zn^{2+} ions in acidic medium , only CuS gets precipitated. This is because

1) CuS more stable than ZnS 2) K_{sp} of CuS = Ksp of Zns

3) K_{sp} of CuS < K_{sp} of ZnS 4) K_{sp} CuS > K_{sp} of ZnS

79. If the total energy of an electron in H - atom is - 3.4 eV then the kinetic energy and potential energy are respectively

1) 6.8eV, -3.4eV 2) 6.8eV, 3.4eV 3) 3.4eV, -6.8eV 4) 3.4eV, -3.4eV

ROUGH

80. The molecular formula of carbon compound 'X' is $C_4H_{10}O$. It liberates hydrogen gas with Na metal and gives turbidity immediately with Lucas Reagent. If the vapours of 'X' are passed over hot copper the product obtained is

1) $CH_3-CH_2-O-CH_2-CH_3$

2) $CH_3CH_2-CH_2-CHO$

3) $CH_3-\underset{\underset{O}{\|}}{C}-CH_2-CH_3$

4) $CH_3-\underset{\underset{CH_3}{|}}{C}=CH_2$

81. The value of K_P for the equillibrium of the reaction $N_2O_{4(g)} \rightleftharpoons 2NO_{2(g)}$ is 2. Calculate the percentage dissociation of N_2O_4 at a pressure of 0.5 atm

1) 71 2) 50 3) 25 4) 88

82. The pH of $10^{-10}M$ $Mg(OH)_2$ solution will be

1) 10 2) 6 3) 4 4) 7.001

83. Consider the following reactions at $1000°C$

1) $Zn_{(s)}+\frac{1}{2}O_2(g)\longrightarrow ZnO_{(s)}$; $\Delta G°=-360\,KJ\,mole^{-1}$

2) $C_{(s)}+\frac{1}{2}O_{2(g)}\longrightarrow CO_{(g)}$; $\Delta G°=-460\,KJ\,mole^{-1}$

Choose the correct statement at $1000°C$

1) Zinc can be oxidised by CO
2) Zinc oxide can be reduced by C
3) Zinc can be reduced by CO
4) Zinc can be reduced by C

84. Copper matte contains

1) Cu_2S and Cu_2O 2) Cu_2O and FeS 3) Cu_2S and FeO 4) Cu_2S and FeS

85. In an adsorption experiment a graph between $\log\frac{x}{m}$ vs log P is found to be linear with a slope of $45°$. The Y - intercept was found to be 0.3010. What is $\frac{x}{m}$ if pressure is 6 bar (tan $45°=1$ and 0.3010 = log 2)

1) 0.6 2) 2.8 3) 6 4) 12

ROUGH

86. 0.303 grams of an organic compound was analysed for nitrogen by Kjeldahl's method. The ammonia evolved was absorbed in 50ml of 0.1N H_2SO_4. The excess acid required 25ml of 0.1N NaOH for neutralisation. The percentage of nitrogen in the compound

1) 11.55% 2) 23.3% 3) 44.6% 4) 18.4%

87. The Vanderwaal's constant 'b' is……times volume of the molecule

1) 4 2) 5 3) 2 4) 10

88. Which one of the following statements is correct

1) Chloroxylenol is a tranquilizer 2) Sucralose is an antiseptic

3) Prontosil is an antimicrobial 4) Seconal is an antipyretic

89. The number of unpaired electrons present in the first excited state of chlorine atom is

1) 1 2) 3 3) 5 4) 2

90. The total number of antibonding electrons in N_2 and O_2 molecules respectively is

1) 4, 8 2) 4, 6 3) 6, 8 4) 5, 8

ROUGH