41. **When a positively charged particle enters a uniform magnetic field with uniform velocity its trajectory can be (i) a straight line (ii) a circle (iii) a helix**

1) (i) only
2) (i) or (ii) only
3) (i) or (iii) only
4) Any one of (i),(ii) and (iii)

42. **Identify the wrong statement**

1) Eddy currents are produced in a steady magnetic field

2) Eddy currents can be minimized by using laminated core

3) Induction furnace uses eddy currents to produce heat

4) Eddy currents can be used to produce breaking force in moving trains.

43. **The electric flux for Gaussian surface A that encloses the charged particles in free is (given ,**
$q_1 = -14nC, q_2 = 78.85nC, q_3 = -56nC$)
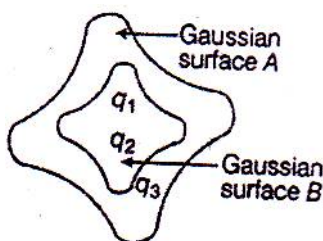
1) $10^3 Nm^2 C^{-1}$
2) $10^3 CN^{-1}m^{-2}$
3) $6.32 \times 10^3 Nm^2 C^{-1}$
4) $6.32 \times 10^3 CN^{-1}m^{-2}$

44. **For the given digital circuit, identify the logic gate if**
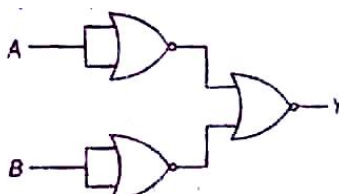
1) OR gate
2) NOR gate
3) NAND gate
4) AND gate

45. **Oxygen is 16 times heavier than hydrogen. Equal volumes of hydrogen and oxygen are mixed. The ratio of speed of sound in the mixture to that in hydrogen is**

1) $\sqrt{8}$
2) $\sqrt{2/17}$
3) $\sqrt{1/8}$
4) $\sqrt{32/17}$

CHEMISTRY

46. **The wavenumber of a spectral line for a given transition is $x\,cm^{-1}$ for He^+ , then its value for Be^{+3} for the same transition is $\left[cm^{-1} \right]$**

1) x
2) $4x$
3) $\dfrac{x}{4}$
4) $16x$

47. **The de- Broglie wavelength of an electron travelling with velocity equal to 10 % of velocity of light is**
1) 242.4 pm
2) 24.2 pm
3) 2.42 pm
4) 2424 pm

48. **Identify the incorrect statement among the following**
1) Among isoelectronic species smaller the positive charge, smaller the radius
2) Among isoelectronic species greater the negative charge, larger the radius
3) Atomic radius increases down the group and decreases across a period
4) The decrease in radius is less in d- block due to poor screening effect of d- orbital

49. The incorrect match among the following is

1) SF_4 - tetrahedral
2) ClF_3 - T shape
3) H_2S - angular
4) BrF_5 - square pyramidal

50. At 400 K the root mean square velocity of a gas X of molecular weight 40 is equal to the most probable velocity of another gas Y at 60 K. The molecular weight of the gas Y is

1) 8　　　　　　2) 12　　　　　　3) 16　　　　　　4) 4

51. The weight of a dibasic acid of molecular weight 200, that should be present in 100 ml of aqueous solution to give 0.1 normal solution is

1) 1g　　　　　2) 2g　　　　　3) 10 g　　　　　4) 20 g

52. The compounds with non zero dipole moment among the following are

A. CCl_4　　　　**B.** Quinol　　　　**C.** P- dichlorobenzene　　**D.** NH_3

1) A and B only　　2) B and C only　　3) B and D only　　4) A,B,C,D

53. The correct order of bond order for the following is

1) $CN^- > O_2^+ > O_2 > O_2^-$　　2) $O_2^- > O_2 > O_2^+ > CN^-$

3) $O_2^+ > O_2^- > CN^- > O_2$　　4) $O_2^- > O_2^+ > O_2 > CN^-$

54. The most ionic compound among the following is

1) LiF　　　　2) CsF　　　　3) $BeCl_2$　　　　4) LiI

55. The number of electrons transferred in the reaction $MnO_4^- + SO_3^{-2} \rightarrow Mn^{+2} + SO_4^{-2}$ is

1) 5　　　　　2) 3　　　　　3) 10　　　　　4) 0

56. Which of the following weighs more

1) 5g atoms of calcium　　　　　　2) 67.2 litres of O_2 at STP
3) 1 g mole of CO_2　　　　　　4) 3×10^{24} atom of carbon

57. Which of the following combinations cannot act as buffer solution

1) 200 ml 0.1 M CH_3COOH + 200 ml 0.1 M $NaOH$

2) $200\,ml\ 0.1M\ CH_3COOH + 200\,ml\ 0.1M\ CH_3COONa$

3) $20\,ml\ 0.5M\ HCN + 20\,ml\ 0.5M\ NaCN$

4) $50\,ml\ 0.1M\ NH_4OH + 50\,ml\ 0.1M\ NH_4Cl$

58. An ideal gas expands in volume from $10^{-4}\ to\ 10^{-3}\ m^3$ at 300 K against a constant pressure of $2 \times 10^5\ Nm^{-2}$. The work done is

1) -180 KJ　　　2) – 180 J　　　3) – 900 J　　　4) + 900 J

59. The dissociation energy of CH_4 is 400 K Cal mol^{-1} and that of ethane is 670 K Cal mol^{-1}. The C-C bond energy is (K Cal mol^{-1})

1) 270　　　　2) 70　　　　3) 200　　　　4) 240

60. At 200 K the equilibrium constant Kc for the following reaction is 0.5 $\dfrac{1}{2}A_2 + \dfrac{1}{2}B_2 \rightarrow AB$. Then the equilibrium constant for the reaction $2AB \rightarrow A_2 + B_2$ at same temperature is

1) 0.04　　　　2) 0.4　　　　3) 4　　　　4) 25

61. Identify the correct statement

1) Stability of carbonates increases down the group in alkali metals

2) $BaSO_4$ is more soluble than $CaSO_4$ in water

3) Li, Mg, Be doesnot give flame test

4) Chemical formula of calgon is $Na_2Al_2Si_2O_8.xH_2O$

62. Which of the following indicates high level of toxicity

1) High DO, high TLV　　　　　2) High COD, high BOD
3) High DO, low COD　　　　　4) Low COD, low BOD

63. The IUPAC name of the compound
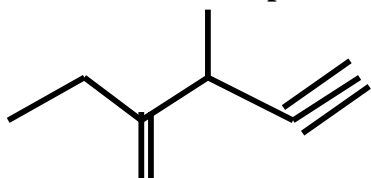
 is

1) 2- ethyl -3- methyl –pent -1-en- 4-yne   2) 2- ethyl- 3-methyl- pent-4-en-1-yne
3) 4-ethyl-3-methyl-pent-1-en-4-yne   4) 4-ethyl-3-methyl-pent-4-en-1-yne

64. The compound that is achiral among the following is
1) 2- hydroxypropanoic acid   2) 2- butanol
3) 2, 3 –dibromopentane   4) 3- bromopentane

65. Propene reacts with HBr in presence of $(C_6H_5CO)_2 O_2$ to give the following as major product
1) Isopropyl bromide   2) Allyl bromide   3) n- propyl bromide   4) 1, 2 dibromopropane

66. In a CCP formed by atoms of $B, \dfrac{1}{3}$ rd of the tetrahedral voids are occupied by A. The formula of the compound formed by them is
1) A_2B_3 2) AB_3 3) A_4B_3 4) A_3B_2

67. The standard reduction potential of metals A,B,C are respectively 0.025V, -5V, -1.6 V. The correct order of reducing ability of these elements is
1) $B > C > A$ 2) $A > C > B$ 3) $A > B > C$ 4) $C > A > B$

68. The coagulating power of ions of electrolyte for As_2S_3 follows the order
1) $Na^+ > Ba^{+2} > Al^{+3}$ 2) $Al^{+3} > Ba^{+2} > Na^+$ 3) $PO_4^{-3} > SO_4^{-2} > Cl^-$ 4) $Cl^- > SO_4^{-2} > PO_4^{-3}$

69. 6 g of a non volatile non electrolyte x when dissolved in 100 g water freezes at $-0.465^0 C$. The molar mass of x is $\left[K_f (H_2O) = 1.86 \, KKgmol^{-1} \right]$
1) 120 g   2) 60 g   3) 240 g   4) 360 g

70. The standard reduction potentials of $Zn^{+2} / Zn, Cu^{+2} / Cu$ and Ag^+ / Ag are respectively are –0.76V, +0.34 V, 0.8 V. The following cells are constructed
i) $Zn / Zn^{+2} // Cu^{+2} / Cu$
ii) $Zn / Zn^{+2} // Ag^+ / Ag$
iii) $Cu / Cu^{+2} // Ag^+ / Ag$ the correct order of E_{cell}^0 of these cells is
1) ii > iii > i   2) ii > i > iii   3) i > ii > iii   4) iii > i > ii

71. For a hypothetical reaction $A + B \rightarrow C$. Identify order of reaction from the following data

S. No	[A] M	[B] M	rate $r \left[ML^{-1} \right]$
I	0.25	0.25	3×10^{-3}
II	0.50	0.25	6×10^{-3}
III	0.50	0.5	1.2×10^{-2}

1) 0   2) 1   3) 2   4) 3

72. The rate constant K_1 for one reaction is double the rate constant K_2 for another reaction. The relation between the corresponding activation energies Ea_1 and Ea_2 is
1) $E_{a_1} > E_{a_2}$ 2) $E_{a_1} < E_{a_2}$ 3) $E_{a_1} = 4E_{a_2}$ 4) $E_{a_1} = 4E_{a_2}$

73. The correct statement regarding extraction of Al from bauxite is
A. During Halls process silica is removed as vapours
B. During Baeyers process, red bauxite is purified using NaOH
C. Aluminium is refined by Hall Herault process
1) Only A   2) Only B   3) A and B only   4) A and C only

74. The complex that show geometric and optical isomerism is

1) $Cis\left[Co(en)_2 Cl_2\right]Cl$
2) $trans-\left[Co(en)_2 Cl_2\right]Cl$
3) $\left[Co(NH_3)_4 Cl_2\right]Cl$
4) $\left[Co(NH_3)_3 Cl_3\right]$

75. The spin only magnetic moment value of Cr^{+x} is 4.9 B. M. The value of x is

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

76. The distribution of electrons ions in $\left[Mn(H_2O)_6\right]^{+2}$ in d-orbitals is

1) $t_{2g}^5 eg^0$
2) $t_{2g}^3 eg^2$
3) $t_{2g}^2 eg^3$
4) $t_{2g}^4 eg^1$

77. 1 mole of an ammino cobalt (III) chloride complex on treatment with excess $AgNO_3$ solution gives 287 g of AgCl. The number of chloride ion that satisfies both primary and secondary valency is

1) 2
2) 3
3) 1
4) 0

78. Identify the incorrect statement from the following

A. Basic nature of hydrides increases from NH_3 to BiH_3

B. H_2S is most volatile hydride of VIA group elements

C. The correct order of acidic nature of hydrides of VIIA group elements is HI > HBr > HCl > HF

D. The correct order of oxidising ability of oxyacid of chlorine is
$HClO_4 > HClO_3 > HClO_2 > HOCl$

1) A and D
2) B and C
3) A,B,C
4) A,B,C,D

79. Which of the following is incorrectly matched

1) $XeF_2 - Linear - SP^3 d$ hybridised
2) $BrF_5 - square\ pyramidal - SP^3 d$ hybridsed
3) $SO_2 - angular - SP^2$ hybridised
4) $SO_3 - triagonal\ planar - SP^2$ hybridsed

80. $B_2H_6 + NH_3 \xrightarrow{200^0 C} A$. The emperical formula of the compound A is

1) BNH
2) CH
3) BNH_2
4) B_2NH

81. The number of hydrogen bonds in the sequence of a structure of a double helical DNA
$5^1\ ATGCCTAAT3^1$ is

1) 19
2) 21
3) 24
4) 20

82. The bacteriostatic antibiotic among the following is

A. Ofloxacin   B. Tetracycline   C. Chloramphenicol   D. Erythromycin

1) A and B only
2) A, B, C only
3) B, C, D only
4) A,B,C,D

83. Which of the following are condensation polymers.

A. Teflon   B. Glyptal   C. Nylon 6,6   D. BUNA-S

1) A and D only
2) A and B only
3) B and C only
4) A and C only

84. A compound (A) with molecular formula $C_4H_8Cl_2$ on basic hydrolysis forms a product B. B gives a orange red precipitate with 2,4- DNP but does not reduce Tollens reagent. The structure of A is

1) $CH_3CH_2CHCl\ CHCl$
2) $CH_3 CH_2\ CCl_2\ CH_3$
3) $CH_3\ CH_2\ CH_2\ CHCl_2$
4) $CH_3\ CHCl\ CHCl\ CH_3$

85. $C_2H_5Cl \xrightarrow[C_2H_5OH]{KCN} A \xrightarrow{H_3O^+} B \xrightarrow{C_2H_5OH} C$ the IUPAC name of C is

1) Ethyl propanoate
2) Methyl propanoate
3) Propylethanoate
4) Ethyl ethanoate

86. $CH_3CHO \xrightarrow{NaOH} A \xrightarrow{\Delta} B$. The product B is

1) $CH_3 - CH_2 - CH_2 - CH_2 - OH$
2) $CH_3 - CH = CH - CHO$
3) $CH_3 - \overset{\overset{O}{\|}}{C} - CH_3$
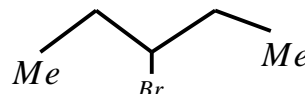4) $CH_3 - CH_2 - CH_2 - CH_3$

87. $C_6H_5NO_2 \xrightarrow[Ni]{H_2} A \xrightarrow[0-5^0 C]{NaNO_2 + HCl} B \xrightarrow[\Delta]{C_2H_5OH} C$ (major) . The compound C is

1) $C_6H_5NH_2$ 2) C_6H_5OH 3) C_6H_6 4) C_6H_5CN

88. The correct order of reactivity towards SN^1 reaction among the following compound is
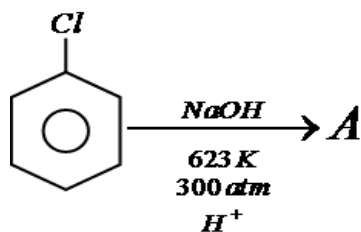

(A)   (B)   (C)
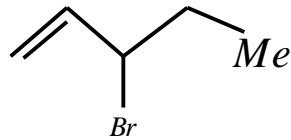
1) A > B > C   2) B > C > A   3) B > A > C   4) C > B > A
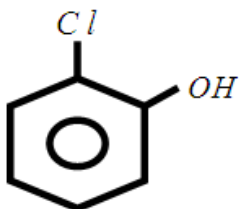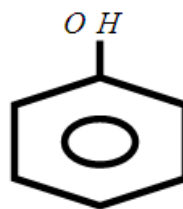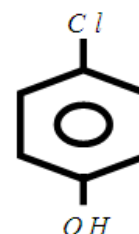
89.

A is

1)   2)   3)   4)

90. The increasing values of pKa for the following compounds is
A. m- nitrophenol   B. Phenol
C. P-nitrophenol   D. O- cresol
E. m- cresol is

1) C < A< B < E < D   2) D < E < B < A < C
3) C < A< D < E < B   4) D < E < C <A < B

BIOLOGY

91. The term taxonomy was coined by
1) Ernst Haeckel   2) H. F Copeland   3) A.P. de Candolle   4) Carolus Linnaeus

92. Which one of the following is correct?
1) Serum =Blood + Fibrinogen   2) Lymph =Plasma + RBC + WBC
3) Blood= Plasma + RBC + WBC + Platelets   4) Plasma = Blood – Lymphocytes

93. Kingdom planate show following characters
A. Cellulosic cell wall
B. Starch is reserve food
C. Absorptive mode of nutrition
1) A and B   2) B and C   3) A and C   4) A, B and C

94. Match the following blood cells with their functions and select the answer from code given below:

Blood cells	Functions
A. Neutrophils	1. Haemostasis
B. Basophils	2. Production of antibodies
C. B lymphocytes	3. Release of histamine
D. Platelets	4. Phagocytosis