43. Two radioactive nuclei P and Q in a given sample decay into a stable nucleus R. At time t=0, number of P species are 4 N_0 and that of Q are N_0. Half – life of P(for conversion to R) is 1 minute where as that of Q is 2 minutes. Initially there are no nuclei of R present in the sample. When number of nuclei of P and Q are equal, the number of nuclei of R present in the sample would be

1) $2N_0$ 2) $3N_0$ 3) $\frac{9N_0}{2}$ 4) $\frac{5N_0}{2}$

44. The wavelength λ_e of an electron and λ_p of a photon of same energy E are related by

1) $\lambda_p \alpha \sqrt{\lambda_e}$ 2) $\lambda_p \alpha \frac{1}{\sqrt{\lambda_e}}$ 3) $\lambda_p \alpha \lambda_e^2$ 4) None of these

45. The area covered by a transmitting antenna of height 50 m is

1) $320\pi km^2$ 2) $1440\pi km^2$ 3) $640\pi km^2$ 4) $120\pi km^2$

CHEMISTRY

46. The ratio of radii of first bohr orbits of He^+ and Li^{+2} is

1) 2 : 3 2) 3 : 2 3) 4 : 9 4) 9 : 4

47. Four electrons in an atom have the sets of quantum numbers as given below. Which electrons in at the highest energy level?

1) $n=4, l=0, m_l=0, m_s=+\frac{1}{2}$ 2) $n=3, l=0, m_l=0, m_s=-\frac{1}{2}$

3) $n=3, l=2, m_l=0, m_s=+\frac{1}{2}$ 4) $n=4, l=1, m_l=-1, m_s=-\frac{1}{2}$

48. If the volume of drop of water is 0.0018 ml then the number of water molecules present in two drops of water at room temperature is

1) 12.046×10^{19} 2) 1.084×10^{18} 3) 4.84×10^{17} 4) 6.023×10^{23}

49. 2.8 g of a gas at 1 atm and 273k occupies a volume of 2.24 litres. The gas can not be.

1) O_2 2) CO 3) N_2 4) C_2H_4

50. If ΔH_f^0 for H_2O_2 and H_2O are -188 kj/mole and -286 kj/mole, What will be the enthalpy change of the reaction $2H_2O_2(l) \rightarrow 2H_2O(l) + O_2(g)$

1) -196 kj/mole 2) -494 kj/mole 3) 146 kj/mole 4) -98 kj/mole

51. The equilibrium constant K_c for the following reaction at 842^0C is 7.90×10^{-3}. What is K_p at same temperature $\frac{1}{2}F_2(g) \rightleftharpoons F(g)$

1) 8.64×10^{-5} 2) 8.26×10^{-4} 3) 7.90×10^{-2} 4) 7.56×10^{-2}

52. The solubility (in mol L^{-1}) of $AgCl\left(K_{sp}=1.0\times10^{-10}\right)$ in a 0.1 M KCl solution will be

1) 1.0×10^{-10} 2) 1.0×10^{-5} 3) 1.0×10^{-11} 4) 1.0×10^{-9}

53. 6g of urea is dissolved in 90g of boiling water. The vapour pressure of the solution is

1) 745 mm 2) 758 mm 3) 761 mm 4) 760 mm

54. Passage of current in amperes for 548 seconds through a silver coulometer results in the deposition of 0.746 g of silver.

1) 1.22 2) 1.16 3) 1.07 4) 1.00

55. Pure water does not conduct electricity because it

1) Is neutral 2) Is readily decomposed
3) Is almost totally unionized 4) Has a low boiling point

56. Which of the following is correct for a first order reaction

1) $t_{1/2} \alpha a$ 2) $t_{1/2} \alpha \frac{1}{a}$ 3) $t_{1/2} \alpha a^0$ 4) $t_{1/2} \alpha a^2$

57. The following data were obtained for the reaction $2NO_{(g)} + Br_{2(g)} \rightarrow 2NOBr_{(g)}$

Experiment	Initial Concentration mole L^{-1} Min^{-1}		Initial Rate
	$[NO]$	$[Br_2]$	
I	0.10	0.10	1.3×10^{-6}
II	0.2	0.1	5.2×10^{-6}
III	0.2	0.3	1.56×10^{-5}

The order of reaction is

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

58. Triclinic crystal has the following unit cell parameter

1) $a=b=c;\alpha=\beta=\gamma=90^0$ 2) $a=b\neq c;\alpha=\beta=\gamma=90^0$

3) $a\neq b\neq c;\alpha\neq\beta\neq\gamma\neq90^0$ 4) $a=b\neq c;\alpha=\beta=90^0,\gamma=120^0$

59. In a cubic unit cell seven of the eight corners are occupied by atoms A and centers of faces are occupied by atoms B. the general formula of the compound is

1) A_7B_6 2) A_7B_{12} 3) A_7B_{24} 4) $A_{24}B_7$

60. Freundlich adsorption isotherm is given by the expression $\frac{x}{m}=kp^{1/n}$ **Then the slope of the line in the plot of** $\log\frac{x}{m}$ *Vs* $\log P$.

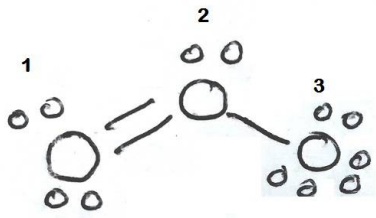
1) $\sqrt{n}$ 2) $\frac{1}{n}$ 3) $\frac{x}{m}$ 4) p

61. Which of the following constitutes a group of the isoelectronic species

1) N_2, O_2^-, NO^+, CO 2) C_2^{2-}, O_2^-, CO, NO

3) $NO^+, C_2^{2-}, CN^-, N_2$ 4) $CN^-, N_2, O_2^{2-}, C_2^{2-}$

62. Molecule the formal charges of oxygen atoms 1,2,3 are respectively



1) -1, 0, +1 2) 0, -1, +1 3) 0, +1, -1 4) +1, 0, -1

63. Which of the following equation denotes that H_2O_2 **acts as a reducing agent**

1) $PbS + 4H_2O_2 \rightarrow PbSO_4 + 4H_2O$ 2) $NaNO_2 + H_2O_2 \rightarrow NaNO_3 + H_2O$

3) $Ag_2O + H_2O_2 \rightarrow 2Ag + O_2 + H_2O$ 4) $2KI + H_2O_2 + H_2SO_4 \rightarrow I_2 + K_2SO_4 + H_2O$

64. Which of the following does not give oxide on heating

1) $MgCO_3$ 2) Li_2CO_3 3) $ZnCO_3$ 4) K_2CO_3

65. Bleaching powder is obtained by the action of chlorine gas and

1) dry slaked lime 2) dilute solution of $Ca(OH)_2$

3) Conc. Solution of $Ca(OH)_2$ 4) dry CaO

66. Borax bead test is used to identify the

1) Anion in coloured salt 2) Cation in coloured salt

3) Anion in white salt 4) Cation in white salt

67. SiO_2 **is reacted with sodium carbonate. What is the gas liberated**

1) CO 2) O_2 3) CO_2 4) O_3

68. Which one of the following not a green house gas?

1) CO_2 2) N_2O 3) O_3 4) N_2

69. Weight ratio of Roasted ore, coke and lime stone fed into the blast furnance in the manufacture of cast iron is

1) 8:1:4 2) 6:4:1 3) 8:4:3 4) 8:4:1

70. The magnetic moment of Cr^{+2} is similar to that of

1) Fe^{+2} 2) Fe^{3+} 3) Co^{3+} 4) Co^{2+}

71. Which of the following will exhibit maximum ionic conductivity.

1) $K_4\left[Fe(CN)_6\right]$ 2) $\left[Co(NH_3)_6\right]C\ell_3$ 3) $\left[Ni(Co)_4\right]$ 4) $\left[Cu(NH_3)_4\right]C\ell_2$

72. Which one of the following is expected to exhibit optical isomerism.

1) Cis $-\left[Pt(NH_3)_2C\ell_2\right]$ 2) Cis $-\left[Co(en)_2C\ell_2\right]^+$

3) Trans $-\left[Co(en)_2C\ell_2\right]^+$ 4) Trans $-\left[Pt(NH_3)_2C\ell_2\right]$

73. Which of the following is a biodegradable polymer

a) PHBV b) Buna-S c) PMMA d) Nylon-2,Nylon-6

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

74.

List – I	**List – II**
I. A	**A) Xerophthalmia, Degeneration of lachxymdl Glands**
II. C	**B) Ostemalaciain adults, rickets in childrens**
III. D	**C) Scurvy, delay in wound heating**
IV. E	**D) Blood coagulation prevent**
V. K	**E) Sterility, neurosis, nutritional nuclear dystrophy**

1) I-a, II-c, III-b, IV-e, V-d 2) I-a, II-b, III-c, IV-d, V-e

3) I-b, II-a, III-c, IV-d, V-e 4) I-a, II-c, III-b, IV-d, V-e

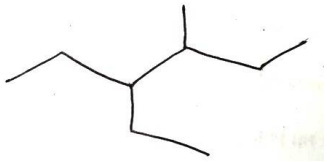
75. The drug used for preventation of heart attacks

1) Aspirin 2) Valium 3) Chlorom phenicol 4) Cephalosoprin

76. During estimation of nitrogen present in an organic compound by Kjeldahl's method. The ammonia evolved from 0.5 gm of compound in Kjeldahl's estimation of nitrogen, neutralized 10 ml of 1M H_2SO_4 **. Find out the percentage of nitrogen in the compound.**

1) 28% 2) 14% 3) 56% 4) 32.3%

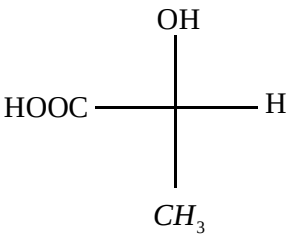
77. The correct IUPAC name of the following compound is



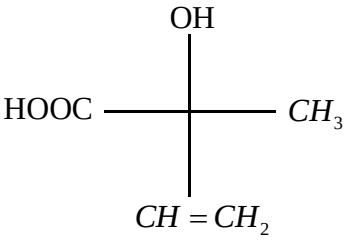
1) 4-methyl-3-ethylhexane 2) 3- ethyl-4-methylhexane

3) 3,4-ethylmethylhexane 4) 4-ethyl-3-methylhexane

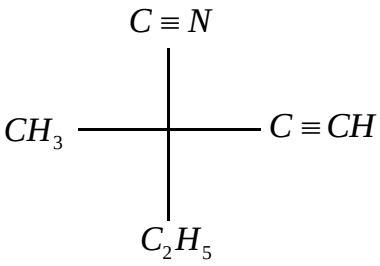
78. The following compounds A,B,C have R (or) S configuration



(A)



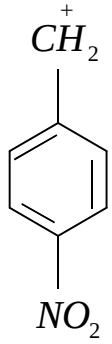
(B)

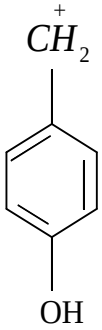


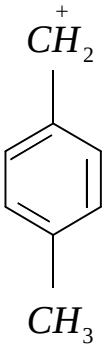
(B)

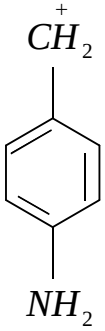
1) R, R, S 2) R, S, R 3) R, R, R 4) S, R, S

79. Arrange the following in increasing order of their stability

I) 

II) 

III) 

IV) 

1) I< II< III< IV 2) II< I< III< IV
3) I< III< II< IV 4) II< III< I< IV

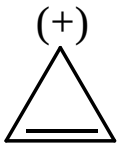
80. Which of the following will not show cis-trans isomerism?

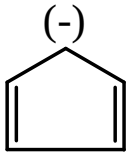
1) $(CH_3)CH=C(CH_3)C\ell$ 2) $(CH_3CH_2)CH=CH(CH_2CH_3)$
3) $(H_3C)_2C=CH-(CH_2-CH_3)$ 4) $(CH_3)_2CH-CH=CH-CH_2-CH_3$

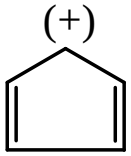
81. $C_2H_5Cl \xrightarrow{alc.KOH} A \xrightarrow{dil.H_2SO_4} B$ **here A and B are**

1) C_2H_4, C_2H_5OH 2) C_2H_6, C_2H_5OH 3) C_3H_8, C_2H_5OH 4) C_2H_2, C_2H_5OH

82. Which of the following compounds is not aromatic

1) 

2) 

3) 

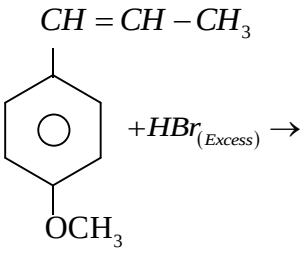
4) 

83. In the following sequence of reactions

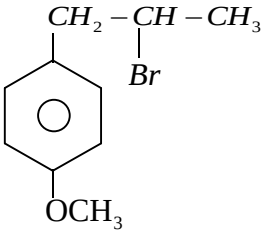
$CH_3-Br \xrightarrow{KCN} A \xrightarrow{H_3O^+} B \xrightarrow[ether]{LiAlH_4} C, C$ **is**

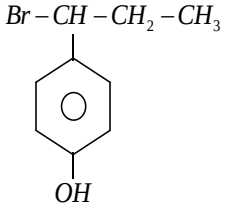
1) Acetone 2) Methane 3) Acetaldehyde 4) Ethyl alcohol

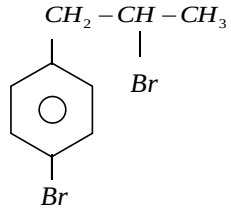
84.

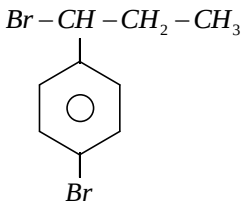


What will be the product formed?

1) 

2) 

3) 

4) 

85. $(CH_3)_3COCH_3 \xrightarrow{+HI(dil)} (CH_3)_3CCl + CH_3OH$ **it follows which mechanism**

1) SN^1 2) SN^2 3) E_1 4) E_2

86. $\text{Benzene} \xrightarrow[A\ell C\ell_3]{CO,HC\ell} A \xrightarrow{\text{Conc.KOH}} B + C$ **Correct statement among the following is**

1) First step is called Kolbe's reaction
2) B and C are benzaldehyde and benzyl alcohol
3) Second step is called Aldol condensation
4) 'A' is benzene carbaldehyde

87. Haloform test is not given by

1) CH_3COCH_3 2) $CH_3COC_2H_5$ 3) $C_6H_5COC_2H_5$ 4) $CH_3CHOHCH_3$

88. Correct acid strength of order of following acids is

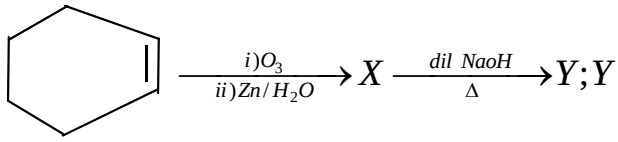
a) $HCOOH$ b) CH_3COOH c) C_6H_5COOH d) CH_3CH_2COOH

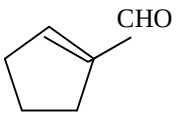
1) a > c > b > d 2) a > b > c > d 3) c > a > b > d 4) d > a > b > c

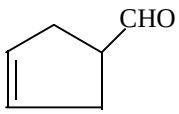
89. Gabriel phthalimide reaction is used for the preparation of

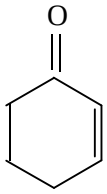
1) Primary aromatic amines
2) Primary aliphatic amines
3) Secondary aromatic amines
4) All

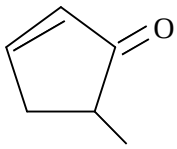
90.



1) 

2) 

3) 

4) 

BIOLOGY

91. Find the correct sequence at various steps of herbarium technique.

a) Drying **b) Poisoning** **c) Collection** **d) Labeling**
e) Mounting **f) Deposition** **g) Stitiching**

1) c,a,b,e,g,d,f 2)c,a,f,d,g,e,b 3) c,b,e,g,d,f,a 4) c,a,e,b,g,d,f

92. Which one is not considered as a natural family planning method?

1) Rhythm /periodic abstinence
2) Withdrawal/ Coitus interrupts
3) Lactational amenorrhoea
4) Vasectomy

93. 'contagium vivum fluidum' (i.e living fluid infester)

1) Mayer 2) Ivanowsky 3) Beijerinck 4) Bawden and pine

94. According to Darwin, evolution is a

1) A sudden but discontinuous process
2) A gradual but discontinuous process
3) A gradual but continuous process
4) A quick and continuous process

95. Genetic material of prokaryotic cell is

1) Non – histonic double – stranded DNA
2) Histonic double – stranded DNA
3) Histone and DNA both are absent
4) Histone without DNA

96. One of the special character of coelenterate only is the occurrence of

1) Hermaphroditism 2) Flame cells 3) Polymorphism 4) Nematocysts