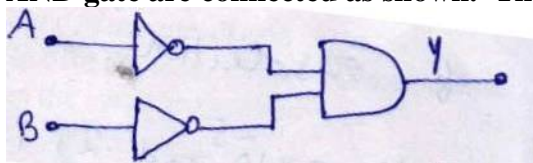


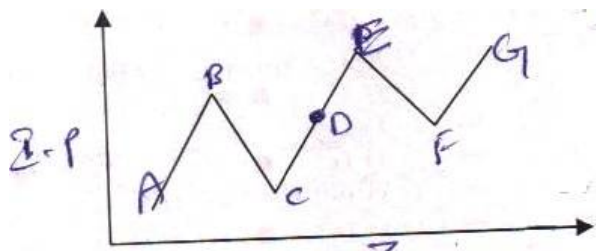
37. Number of fissions per second in a reactor of power 2W is (given energy released per fission is 200MeV)
- 1) 6.2×10^{10} 2) 62×10^{10} 3) 0.62×10^{10} 4) 3.2×10^{10}
38. Half life of a radioactive substance A is 3 times the half life of another radioactive substance B. Initially the number of nuclei of A and B are N_A and N_B respectively. After two half lives of A, number of nuclei of both are equal. Then the ratio $\frac{N_A}{N_B}$ is
- 1) $\frac{1}{8}$ 2) $\frac{1}{16}$ 3) $\frac{1}{4}$ 4) $\frac{1}{3}$
39. A potential barrier V volts exists across a P-N junction the thickness of the depletion region is 'd'. An electron with velocity 'v' approaches, P-N junction from N side. The velocity of the electron across the junction is
- 1) $\sqrt{v^2 + \frac{2Ve}{m}}$ 2) $\sqrt{v^2 - \frac{2Ve}{m}}$ 3) V 4) $\sqrt{\frac{2Ve}{m}}$
40. Two NOT gates and one AND gate are connected as shown. The system is equivalent to
- 
- 1) AND 2) NOR 3) OR 4) NAND
41. If the minimum voltage in an AM wave was found to be 4V and maximum voltage 12V. Find percent modulation index.
- 1) 75% 2) 60% 3) 66.7% 4) 50%
42. Parallel rays of light focused by a thin convex lens. A thin concave lens of same focal length then joined to the convex lens and the result is that.
- 1) The focal point shifts away from the lens by a small distance
2) The focal point shifts towards the lens by a small distance
3) The focal point of lens does not shift at all
4) The focal point shifts to infinity.
43. A bird in air looks at a fish vertically below it and inside water. X is the height of the bird above the surface of water and Y is the depth of the fish below surface of water. If refractive index of water w.r.t air is μ , the distance of the fish as observed by the bird is
- 1) $X+Y$ 2) $X + \frac{Y}{\mu}$ 3) $\mu X+Y$ 4) $\mu X+\mu Y$
44. Light of wave length 789nm is used to view an object under a microscope. The aperture of the objective has a diameter of 0.8cm. Find the limiting angle of resolution.
- 1) 12.03×10^{-5} rad 2) 120.3×10^{-5} rad 3) 12.03×10^{-7} rad 4) 120.3×10^{-7} rad
45. A parallel beam of light of wavelength 400nm falls on a narrow slit and the resulting diffraction pattern is observed on screen 0.5m away. It is observed that the first minimum is at a distance of 2mm from the centre of the screen. Find the width of the slit
- 1) 2cm 2) 2mm 3) 0.2×10^{-4} m 4) 2×10^{-4} m

PHYSICS

46. K_C for $A+B \rightleftharpoons 3C$ is 20 at 25°C , if a 2 liter vessel contains 1,2 and 4 mole of A, B and C respectively, the reaction at 25°C shall
- 1) Proceed from left to right 2) Proceed from right to left
3) Be at equilibrium 4) Not occur
47. Solubility of AgCl in 0.1M NaCl is (K_{sp} of AgCl = 1.2×10^{-10})
- 1) 0.05M 2) 1.2×10^{-6} M 3) 2×10^{-5} M 4) 1.2×10^{-9} M

48. A system absorbs 600J of energy and does worked equivalent to 400J of energy. The internal energy change is
 1) 1000J 2) 200J 3) 600J 4) 300J
49. $N_2 + 3H_2 \rightleftharpoons 2NH_3$, $\Delta H = -46$ K cal. From the above equation, heat of formation of ammonia is
 1) 46 K. cal 2) -46 K cal 3) -23 k. cal 4) 23 K. cal
50. +1 oxidation state is stable for the element
 1) B 2) Al 3) Ga 4) Tl
51. The empirical formula of 'A' in the following reaction $B_2H_6 + NH_3 \xrightarrow{200^\circ C} 'A'$
 1) BNH 2) CH 3) BNH_2 4) B_2NH
52. Carbon suboxide C_3O_2 has
 1) bent structure 2) trigonal planer structure
 3) Linear structure 4) distorted tetrahedral structure
53. The IUPAC name of the following compound is $CH_3 - CH(C_2H_5) - CH = CH - CH_3$
 1) 2 - ethyl but 2 ene 2) 5 -ethyl pent 2 ene 3) 4 ethyl pent 2 ene 4) 5 - methyl pent 2 ene
54. Which of the following carbo catians is most stable
 1) $CH_3 - CH_2^+$ 2) $CH_2 = CH^+$ 3) $CH \equiv C^+$ 4) $C_6H_5^+$
55. 0.259 gm of an organic compound when treated by carius method gave 0.35 gm of $BaSO_4$. The percentage of sulphur in the compound is
 1) 16.23% 2) 18% 3) 18.5% 4) 42%
56. $B \xleftarrow{alc.KOH, \Delta} C_2H_5Cl \xrightarrow[C_2H_5OH]{Zn-Cu} A$. here compounds A and B are
 1) CH_4, C_2H_4 2) C_2H_4, C_2H_6 3) C_2H_6, C_2H_4 4) C_2H_6, C_2H_5OH
57. Which of the following is contaminant
 1) SO_2 2) Pb 3) NaCl 4) MIC
58. 18 gm of a non volatile solute is dissolved in 900 gm of H_2O such that the relative lowering of vapour pressure is 0.0019. The molecular weight of the solute is nearly
 1) 60 2) 342 3) 189 4) 18
59. Of the following, the solution with higher vapour pressure is
 1) 10% Glucose 2) 10% Urea
 3) 10% Sucrose 4) All of these have same V.P.
60. The radius of the Na^+ is 95 Pm that of \overline{Cl} ion is 181 pm. Predict that coordination number of Na^+
 1) 4 2) 6 3) 8 4) unpredictable
61. What is the EMF of the cell?
 $Zn_{(s)} / Zn^{+2}_{(0.1M)} // Sn^{+2}_{(0.001M)} / Sn_{(s)}$. Given $E^0_{sn^{+2}/Sn} = -0.14v$ and $E^0_{Zn^{+2}/Zn} = -0.76V$
 1) 0.62 2) 0.56v 3) 1.12v 4) 0.31v
62. 99% completion of a first order reaction takes place in 22 min. The time taken for 99.9% completion of the reaction will be
 1) 33 min 2) 52 min 3) 56 min 4) 44 min
63. Gels is the mixture of
 1) solid in liquid 2) liquid in solid 3) liquid in gas 4) Gas in liquid
64. The correct order of basic nature of hydrides of group - 15 elements is
 1) $NH_3 > ASH_3 > SbH_3 > BiH_3 > PH_3$ 2) $NH_3 > PH_3 > ASH_3 > SbH_3 > BiH_3$
 3) $BiH_3 > SbH_3 > ASH_3 > PH_3 > NH_3$ 4) $PH_3 > BiH_3 > SbH_3 > ASH_3 > NH_3$
65. In which pair of ions both the species contain s-s bond?
 1) $S_2O_7^{-2}, S_2O_3^{-2}$ 2) $S_4O_6^{-2}, S_2O_3^{-2}$ 3) $S_4O_6^{-2}, S_2O_3^{-2}$ 4) $S_4O_6^{-2}, S_2O_7^{-2}$
66. The correct order of acidic strength
 1) $HF < Hcl > HI > HF$ 2) $Hcl < HBr < HF < HI$
 3) $HBr > Hcl > HI > HF$ 4) $HI > HBr > Hcl > HF$

67. The number of lone pairs and bond pairs present on Xe of XeO_3 molecule
 1) 1,3 2) 1,6 3) 4,3 4) 6,1
68. Which of the following designation is impossible?
 1) $4f$ 2) $5g$ 3) $2d$ 4) $6p$
69. An electron having magnetic quantum number +2 cannot have allowed 'n' and 'l' values respectively
 1) $n = 4, l = 3$ 2) $n = 3, l = 2$ 3) $n = 4, l = 2$ 4) $n = 2, l = 3$
70. The pair elements possess almost the same properties
 1) $\text{Eu} - \text{Yb}$ 2) $\text{Nb} - \text{Ti}$ 3) $\text{Mo} - \text{W}$ 4) $\text{Tc} - \text{Re}$
71. The ionization enthalpy of second period elements vary with atomic number as



The element present at points B and E are

- 1) Be, c 2) B, N 3) Be, O 4) Be, N
72. The correct order of bond energies in No , No^+ and No^-
 1) $\text{No}^- > \text{No} > \text{No}^+$ 2) $\text{No} > \text{No}^- > \text{No}^+$ 3) $\text{NO}^+ > \text{NO} > \text{NO}^-$ 4) $\text{No}^+ > \text{No}^- > \text{No}$
73. Dipole moment is shown by
 1) cis - 1,2 - Dichloro ethene 2) Trans 1-2 dichloro ethene
 3) Trans - 2-3- dichloro -2-pentene 4) Both 1 and 3
74. The density of CO_2 gas at 27°C and 1 atm pressure is ____ (gram/lit)
 1) 1.78 2) 1.52 3) 1.96 4) 1.2
75. 16 gm of oxygen occupies a volume of 22.4 liters at 1 atm and
 1) 0°C 2) 30°C 3) 273°C 4) 273K
76. The molarity of a solution obtained by mixing 750 ml of 0.5M HCl with 250 ml of 2M HCl will be
 1) 0.875M 2) 1.0M 3) 1.75M 4) 0.097M
77. Oxidation numbers of N in NH_4NO_3 respectively are
 1) -3, +5 2) +5, -3 3) -3, -3 4) +5, +5
78. H_2O_2 turns blacked lead paintings to white colour. In this reaction it oxidizes pbs to pbso_4 . The number of moles of H_2O_2 needed to oxidize one mole of pbs is ?
 1) 1 2) 2 3) 0.5 4) 4
79. The calcium phosphate slag is commercially known as
 1) Thomas slag 2) Baeyer's slag 3) Wohler's slag 4) Matle
80. The electronic configuration of Gadolinium ($z=64$)
 1) $\{\text{Xe}\} 4f^8 5d^9 6s^2$ 2) $\{\text{Xe}\} 4f^7 5d^1 6s^2$ 3) $\{\text{Xe}\} 4f^7 5d^5 6s^2$ 4) $\{\text{Xe}\} 4f^6 5d^5 6s^2$
81. Complex compounds λ_{max} (absorbed)
 a) $[\text{CrCl}_6]^{-3}$ 758 \AA b) $[\text{Cr}(\text{NH}_3)_6]^{+3}$ 465 \AA
 c) $[\text{Cr}(\text{H}_2\text{O})_6]^{+3}$ 694 \AA
- The correct order of CFSE of these complexes ions will be
 1) $a > b > c$ 2) $a > c > b$ 3) $b > c > a$ 4) $a = b = c$

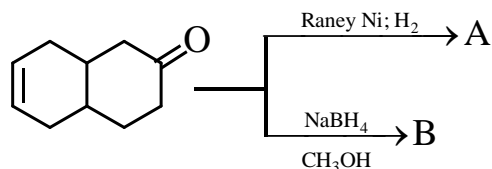
82. Identify 'Z' in the following series $C_2H_5 - I \xrightarrow{Alc.KOH} X \xrightarrow{Br_2} Y \xrightarrow{KCN} Z$

- 1) $CH_3 - CH_2 - CN$ 2) $NCCH_2 - CH_2 - CN$ 3) $BrCH_2 - CH_2 - CN$ 4) $BrCH = CHCN$

83. Incorrect order is

- 1) p^{K_a} value : p-nitro phenol < o-nitro phenol < m-nitrophenol
 2) K_a - value : o-cresol < p-cresol < m-cresol
 3) Acidic strength : o-fluoro phenol > o-chloro phenol > o-bromo phenol
 4) Acidic strength : phenol > water > alcohol.

84.



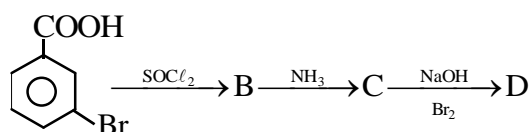
For products A and B respectively are

- 1) and
 2) and
 3) and
 4) and

85. Preparation of ether by acid dehydration of secondary (or) tertiary alcohol is not a suitable method due to

- 1) Presence of more basic alcohols 2) Steric hindrance
 3) Formation of more stable carbonation 4) Formation of less stable carbocetia

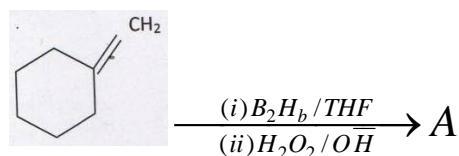
86.



Identify the product 'D' in the following :

- 1) 2)
 3) 4)

87.



- 1) Cyclohexane 2) Methyl Cyclohexene
 3) Cyclo hexyl Methanol 4) Methyl cyclo hexane carbaldehyde

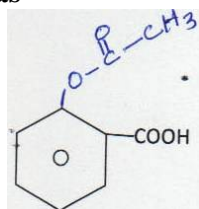
88. Which of the following is not a biopolymer

- 1) Proteins 2) Nucleic acids 3) cellulose 4) Neoprene

89. 'Liver' cells are rich in vitamins

- 1) B,A 2) A,D 3) D,E 4) K,E

90. The compound is used as



- 1) antiseptic 2) antibiotic 3) analgesics 4) Pesticide

BIOLOGY

91. Name the prothallus is precursor to seed habit which is retained on the parent sporophyte

- 1) Male prothallus - pteridophyte
2) Female prothallus - pteridophyte
3) Both male & female prothallus - pteridophyte
4) Male gametophyte – pteridophyte

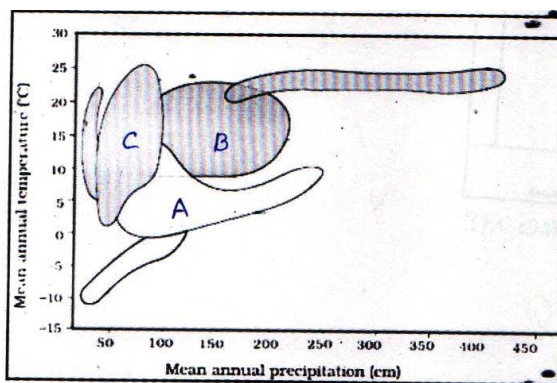
92. Branch of Zoology which deals with heredity and variations

- 1) Genetics 2) Evolution 3) Ecology 4) Ethology

93. How many carbon atoms are present in palmitic acid and Arachidonic acid respectively

- 1) 20 'C' & 16 'C' 2) 20 'C' & 20 'C' 3) 16 'C' & 16 'C' 4) 16 C & 20 C

94.



Identify the A,B,C places after above diagram (biome with respect annual rain fall)

- | | A | B | C |
|---|------------|------------|------------|
| 1 | Temperate | Coniferous | Grass Land |
| 2 | Coniferous | Temperate | Grass Land |
| 3 | Coniferous | Grass Land | Temperate |
| 4 | Temperate | Grass Land | Coniferous |

95. Chromosomal theory of Inheritance is experimentally proved by

- 1) Sutton and Boveri 2) T.H. Morgan 3) Bateson 4) Mendal

96. Match the Following

Syndrome

- 1 Down's Syndrome
2. Klinefelter's Syndrome
3. Turner's Syndrome

Symptoms

- a. gynecomastia
b. Short stature
c. Furrowed Tongue

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

97. Exogenous spores are produced in

- 1) Penicillium 2) mucor 3) Rhizopus 4) Euglena

98. Arrange the following sequentially to for sucked out milk from mammary gland

- a. Alveoli b. Ampulla c. mammary tubules
d. Lactiferous duct e. mammary duct f. Nipple

- 1) a-c-e-b-d-f 2) a-c-e-d-b-f 3) a-c-d-b-e-f 4) a-c-d-d-e-f

99. Which of the following is not a monocarpic plant

- 1) Rice 2) Maize 3) Wheat 4) Mango