I

INSTRUCTIONS **NUMBER OF QUESTIONS : 100** **TIME : 2 Hrs**

1. ATTEMPT ALL QUESTIONS WITHIN THE TIME.
2. EACH QUESTION CARRIES 1 MARK
3. NO NEGATIVE MARKS.
4. DON'T DO ROUGH WORK ON QUESTION PAPER AND OMR.
5. USE BLACK (OR) BLUE PEN FOR BUBBLING ON OMR.

CORRECT METHOD OF BUBBLING

1 ● 3 4

WRONG METHOD OF BUBBLING

✓ ✗ ◑ ◓

INTO 10+1 ICSE

MATHEMATICS

1. The sum of two consecutive positive odd numbers if the sum of their squares is 74

   1) 12 2) -12 3) 13 4) -13

2. If $A=\begin{bmatrix} 3 & -2 \\ 7 & 4 \end{bmatrix}$ then A-A^T (where A^T is transpose of A) is

   1) $\begin{bmatrix} 0 & 9 \\ -9 & 0 \end{bmatrix}$ 2) $\begin{bmatrix} 0 & -9 \\ 9 & 0 \end{bmatrix}$ 3) $\begin{bmatrix} 0 & 3 \\ -3 & 0 \end{bmatrix}$ 4) $\begin{bmatrix} 0 & -3 \\ 3 & 0 \end{bmatrix}$

3. The line 2x-y=6 passes through the point (K,6) then the value of K is

   1) 5 2) 4 3) 2 4) 6

4. Two circles of radii 5 cm and 4 cm are concentric .The length of the chord of the outer circle which touch the inner circle is

   1) 8 2) 9 3) 6 4) 10

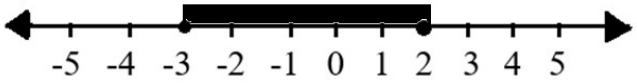
5. The mode of 2,2,3,5,5,5,6,8,3 is

   1) 2 2) 3 3) 5 4) 6

6. The solution set of y if $2y-4 \le y+2 \le 3y+6$, where y is a positive odd integer

   1) $\{1, 3\}$ 2) $\{1, 3, 5\}$ 3) $\{0, 1, 3, 5\}$ 4) $\{1, 3, 5, 7\}$

7. From the graph given, write an inequation taking x as the variable



   1) $\{x : -3 < x < 2 \text{ and } x \in R\}$ 2) $\{x : -3 \le x \le 2 \text{ and } x \in R\}$

   3) $\{x : -3 < x \le 2 \text{ and } x \in R\}$ 4) $\{x : -3 \le x < 2 \text{ and } x \in R\}$

8. If $x=\frac{\sin^3 p}{\cos^2 p}, y=\frac{\cos^3 p}{\sin^2 p}$ *and* $\sin p+\cos p=\frac{1}{2}$ then $x+y=$

1) $\frac{79}{18}$ 2) $\frac{75}{18}$ 3) $\frac{44}{9}$ 4) $\frac{48}{9}$

9. What is the smallest possible natural number n for which the equation $x^2 - nx + 2014 = 0$ has integer roots?

1) 89 2) 91 3) 75 4) 68

10. If $\frac{1}{3}$ and 1 are the solutions of the equation $mx^2+nx+6=0$ then $m-n=$

1) -12 2) 10 3) 30 4) 42

11. If the equation $(2-m)x^2-(5+m)x-16=0$ has equal roots then the values of *m* are

1) {3, 5, 2} 2) {51, 3} 3) {-3, 51} 4) {-3, -51}

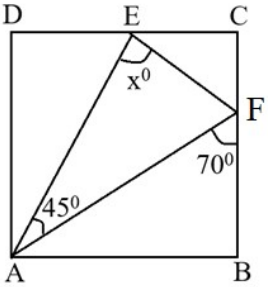
12. The quadratic equation whose roots are 2, 3 is

1) $2x^2-10x+7=0$ 2) $x^2-5x+4=0$ 3) $3x^2-15x+18=0$ 4) $4x^2-20x+18=0$

13. The value of *x* satisfying the equation $\frac{x}{x+1}+\frac{x+1}{x}=2\frac{1}{2}$

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

14. In the adjacent figure ABCD is a square, E, F are points on DC and BC if $\angle AFB=70^0$ and $\angle EAF=45^0$ *then* $\angle AEF$?



1) 70^0 2) 45^0 3) 30^0 4) 65^0

15. If $x=\sec\theta-\tan\theta, y=\cos ec\theta+\cot\theta$ *then* $y=$

1) $\frac{1+x}{1-x}$ 2) $\frac{1-x}{1+x}$ 3) $\frac{x}{1-x}$ 4) $\frac{x}{1+x}$

16. The perimeter of a rectangle is 110m and its area is $750m^2$ then its diagonal is

1) $5\sqrt{21}$ 2) 20 3) 35 4) $5\sqrt{61}$

17. The sum of two natural numbers which differ by 6 and sum of their squares is 146 is

1) 15 2) 16 3) 17 4) 18

18. The product of the digits of a two digit number is 27. If its units digit exceeds twice its ten's digit by 3, then sum of the digits of the number is

1) 9 2) 12 3) 14 4) 15

19. The sum of first 'n' even natural numbers is 600 then the value of 'n' is

1) 25 2) 20 3) 30 4) 24

20. If α,β are roots of $x+\frac{1}{x}=\frac{5}{2}$ then the value of $\alpha\beta$ is

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

21. Find the common difference of the A.P 32, 27, 22, 17,…….

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

22. Degree of $(x-a)(x-b)(x-c).....(x-z)$ *is* _____

1) 0 2) 1 3) 26 4) Does not exist

23. If a letter is drawn at random from letters of the word MATHEMATICS, find the probability of getting M

1) $\frac{1}{11}$ 2) $\frac{2}{11}$ 3) $\frac{3}{11}$ 4) $\frac{1}{8}$

24. If x + 2 is a factor of $x^2 + 5x + 2a = 0$ then a =

1) -3 2) 3 3) 4 4) –2

25. If $A=\begin{bmatrix}8 & -6\\ 4 & -2\end{bmatrix}, B=\begin{bmatrix}3 & 5\\ -1 & 0\end{bmatrix}$ and X is a 2×2 matrix such that A + X = B then X =

1) $\begin{bmatrix}-5 & 11\\ -5 & -2\end{bmatrix}$ 2) $\begin{bmatrix}-5 & 11\\ 5 & 2\end{bmatrix}$ 3) $\begin{bmatrix}-5 & 11\\ 5 & -2\end{bmatrix}$ 4) $\begin{bmatrix}-5 & 11\\ -5 & 2\end{bmatrix}$

26. If $A=\begin{bmatrix}-2 & 3\\ 4 & 1\end{bmatrix}$ *and* $B=\begin{bmatrix}1 & 2\\ 3 & 5\end{bmatrix}$ then BA =?

1) $\begin{bmatrix}7 & 11\\ 7 & 13\end{bmatrix}$ 2) $\begin{bmatrix}6 & 5\\ 14 & 14\end{bmatrix}$ 3) $\begin{bmatrix}15 & 22\\ 5 & 10\end{bmatrix}$ 4) $\begin{bmatrix}15 & 5\\ 22 & 10\end{bmatrix}$

27. How many terms are there in the series 4, 7, 10, 13,……,118 is

1) 49 2) 40 3) 39 4) 48

28. The sum of first 20 terms of the A.P 1, 3, 5, 7…….

1) 650 2) 660 3) 670 4) 400

29. If $A=(2,3)$ *and* $B=(5,7)$ *then* distance between A & B

1) 25 2) 21 3) 5 4) 40

30. The sum of the geometric series $\sqrt{2},2,2\sqrt{2},....$upto 12 terms is

1) $64\left(2+\sqrt{2}\right)$ 2) $63\left(2+\sqrt{2}\right)$ 3) $31\left(2+\sqrt{2}\right)$ 4) $15\left(2+\sqrt{2}\right)$

31. The coordinates of the point of intersection of medians of the triangle ABC; given A = (2, 3), B = (6, 7), C = (-4, 1)

1) $\left(\frac{8}{3},\frac{11}{3}\right)$ 2) $\left(\frac{4}{3},\frac{4}{3}\right)$ 3) $\left(\frac{4}{3},\frac{11}{3}\right)$ 4) $\left(\frac{8}{3},\frac{4}{3}\right)$

32. If A = (5, 3), B = (4, 4), C = (7, -3). The ratio in which B divides the line segment $\overline{AC}$ is

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

33. If (K, 6) lies on the line 7x – 4y + 3 = 0 then K =

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

34. The slope of the line joining the points (4, 5) and (*a*, 2) is 1 then *a* =

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

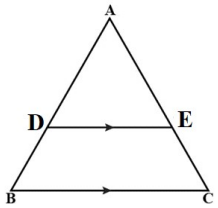
35. Find the value of $\sin 30^0+\cos 90^0$ *is*

1) 0.5 2) 0.7 3) 1 4) -0.5

36. In ΔPQR, $\angle Q = 90^0$ and QM is perpendicular to PR then PQ^2

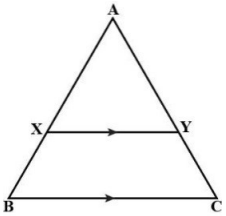
1) $PR \times MR$ 2) $PM \times PR$ 3) $PR^2 + QR^2$ 4) $PR \times QR$

37. In the adjoining figure, $DE \parallel BC$ and D divides AB in the ratio 4 : 5 then $\frac{AE}{AC} =$



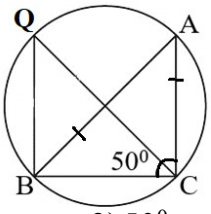
1) 2 : 3 2) 4 : 3 3) 4 : 5 4) 4 : 9

38. In the figure, AX : XB = 2 : 3 then the ratio between the trapezium XBCY and triangle ABC



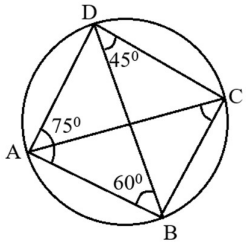
1) 9 : 5 2) 5 : 9 3) 25 : 21 4) 21 : 25

39. In the adjoining figure, AB = AC and $\angle ACB = 50^0$ *then* $\angle BQC =$



1) 40^0 2) 70^0 3) 50^0 4) 80^0

40. In the given figure, $\angle BAD = 75^0$, $\angle ABD = 60^0$, $\angle BDC = 45^0$ then $\angle ACB =$



1) 55^0 2) 40^0 3) 45^0 4) 60^0

41. The radius of the base and height of a right circular cone are 5cm and 12cm respectively. The total surface area of the cone is

1) 282.85 2) 942.85 3) 253.85 4) 952.85

42. $\frac{\sin A}{1 - cosA} + \frac{\sin A}{1 + \cos A} =$

1) 2 sec A 2) 2 sin A 3) 2cosec A 4) 2 tan A

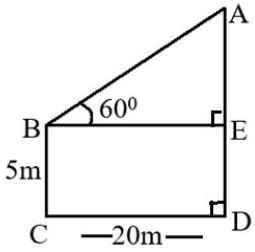
43. $(1 + \tan A)^2 + (1 - \tan A)^2 =$

1) $2\text{cosec}^2 A$ 2) $2\tan^2 A$ 3) $2\sin^2 A$ 4) $2\sec^2 A$

44. $\sqrt{\frac{1-\cos A}{1+\cos A}} =$

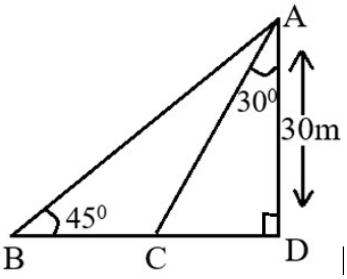
1) secA + tanA 2) cosecA-cotA 3) secA-tanA 4) cosecA+cotA

45. From diagram, if the values of BC = 5m, CD = 20m and $\angle ABE = 60^0$ then AD =



1) $5\left(4\sqrt{3}+1\right)m$ 2) $5\left(4-\sqrt{3}\right)m$ 3) $5+\frac{20}{\sqrt{3}}m$ 4) $5-\frac{20}{\sqrt{3}}m$

46. From diagram if AD = 30m, $\angle CAD = 30^0, \angle ABC = 45^0$ then the value of BC =



1) $10\left(3+\sqrt{3}\right)m$ 2) $3\left(10-\sqrt{3}\right)m$ 3) $10\left(3-\sqrt{3}\right)m$ 4) $10+\sqrt{3}m$

47. If the mean of 7, 11, x, 5 and 6 is 7 then x =

1) 5 2) 7 3) 4 4) 6

48. If the median of the values 3, 6, 7, 11, 14, 2, 9 is

1) 13 2) 6.5 3) 7 4) 9

49. If two dice are thrown simultaneously. Then the probability of getting sum of the numbers on their upper face is 7 is

1) $\frac{5}{36}$ 2) $\frac{1}{6}$ 3) $\frac{2}{9}$ 4) $\frac{1}{36}$

50. A ball is drawn at random from a box containing 16 white, 12 yellow and 20 pink balls. The probability of not getting yellow ball is

1) $\frac{1}{4}$ 2) $\frac{2}{3}$ 3) $\frac{6}{7}$ 4) $\frac{3}{4}$

ARITHMETIC AND LOGICAL REASONING QUESTIONS:

51. A is B's sister. C is B's mother. D is C's father. E is D's mother. Then, how is A related to D?

1) Grandmother 2) Grandfather 3) Daughter 4) Grand daughter

52. If + means - , - means ×, × means ÷ and ÷ means +, then
15 × 3 ÷ 15 + 5 – 2 = ?

1) 0 2) 6 3) 10 4) 20

53. Kunal walks 10 km towards North. From there he walks 6 km towards South. Then, he walks 3 km towards East. How far is he with reference to his starting point?

1) 8 km 2) $3\sqrt{5}km$ 3) $\sqrt{109}km$ 4) 5 km

54. If the first and third letters in the word NECESSARY were interchanged, also the fourth and the sixth letters, and the seventh and the ninth letters which of the following would be the seventh letter from the left?

1) A 2) Y 3) R 4) E

55. Reena is twice as old as Sunita. Three years ago, she was three times as old as Sunita. How old is Reena now?

1) 6 years 2) 7 years 3) 8 years 4) 12 years

56. How many 6's are there in the following series of numbers which are preceded by 7 but not immediately followed by 9?

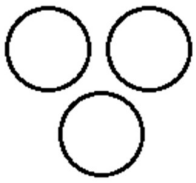
6 7 9 5 6 9 7 6 8 7 6 7 8 6 9 4 6 7 7 6 9 5 7 6 3

1) One 2) Two 3) Three 4) Four

57.

1) 117 2) 36 3) 32 4) 26

58. Which of the following figures represents village, district, state?

1)  2)  3)  4) 

59. Find the odd one among the following

1) Wood 2) Stone 3) Cork 4) paper

60. Complete the series 3, 8, 15, 24, ?

1) 32 2) 33 3) 35 4) 40

PHYSICS

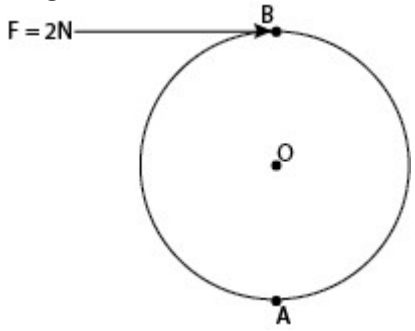
61. A mechanic can open a nut by applying a force of 150N while using a lever handle of length 40cm. How long a handle is required if he wants to open it by applying a force of only 50N?

1) 1.2m 2) 1.4m 3) 1.8m 4) 2m

62. A body is acted upon by two unequal forces in opposite directions, but not in the same line. The effect is that:

1) The body will only have rotational motion
2) The body will only have translational motion
3) The body will have neither rotational motion nor translational motion
4) The body will have rotational as well as translation motion

63. A wheel of diameter 2m is shown in figure with axle at O. A force F = 2N is applied at B in the direction shown in figure. Calculate the moment of force about the point A.



1) 2 N-m clockwise
2) 4 N m clockwise
3) 4 N m anti clockwise
4) 2 N m anti clockwise

64. A ball of mass *m* is thrown vertically up with an initial velocity so as to reach a height *h*. The correct statement is:
1) Potential energy of the ball at the ground is *mgh.*
2) Kinetic energy of the ball at the ground is zero
3) Kinetic energy of the ball at the highest point is *mgh*
4) Potential energy of the ball at the highest point is *mgh*

65. A pendulum is oscillating on either side of its rest position. The correct statement is:
1) It only has kinetic energy at each position
2) It has the maximum kinetic energy at its extreme position
3) It has the maximum potential energy at its mean position
4) The sum of its kinetic and potential energies remains constant throughout the motion.

66. The correct relationship between mechanical advantage (M.A.), velocity ratio (V.R.) and efficiency (η) is:
1) $M.A. = \eta \times V.R.$ 2) $V.\mathrm{R.} = \eta \times M.\mathrm{A.}$ 3) $\eta = M.\mathrm{A.} \times \mathrm{V.R.}$ 4) None of these

67. A concave lens forms the image of an object which is:
1) Virtual, inverted, and diminished
2) Virtual, upright and diminished
3) Virtual, inverted, and enlarged
4) Virtual, upright and enlarged

68. The focal length of a camera lens is 20cm. Find how far away from the film must the lens be set in order to photograph an object located at a distance 100cm from the lens.
1) 28cm 2) 20cm 3) 25cm 4) 30cm

69. The lens of power +1.0D is:
1) Convex of focal length 1.0 cm
2) Convex of focal length 1.0m
3) Concave of focal length 1.0 cm
4) Concave of focal length 1.0m

70. The wavelength of red light is 800nm. Find its frequency. Speed of light $= 3 \times 10^8 m\ s^{-1}$
1) $4.25 \times 10^{14} Hz$ 2) $3.00 \times 10^{14} Hz$ 3) $4.75 \times 10^{14} Hz$ 4) $3.75 \times 10^{14} Hz$

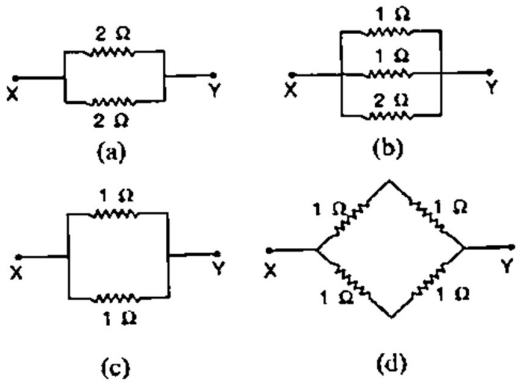
71. The minimum distance between the source and the reflector in air, to hear an echo, is approximately:
1) 10m 2) 17m 3) 34m 4) 50m

72. Calculate the resistance of 1km long copper wire of radius 1mm.

(Specific resistance of copper is $1.72 \times 10^{-8} \Omega$ m)

1) 4Ω 2) 5Ω 3) 5.5Ω 4) 4.5Ω

73. Which of the following combinations have the same equivalent resistance between X and Y?



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

74. The moment of a force of 5N about a point P is 2Nm. Calculate the distance of point of application of the normal force from the point P

1) 0.1m 2) 0.2m 3) 0.4m 4) 0.3m

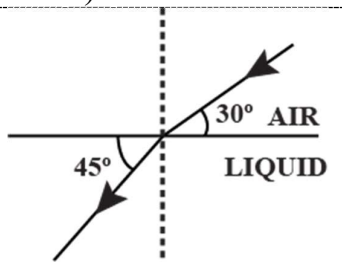
75. Express 5kWh into joule

1) 1.8×10^7J 2) 1.8×10^8J 3) 3×10^7J 4) 1.8×10^6J

76. A water pump raises 50 litre of water through a height of 25m in 5s. calculate the power of the pump used (assuming 100% efficiency) (Take g = 10N kg^{-1} and density of water = 1000kg m^{-3})

1) 2000W 2) 250W 3) 2500W 4) 100W

77. Use snell's law to find the refractive index of liquid with respect to air



1) $\sqrt{\frac{3}{2}}$ 2) $\frac{1}{\sqrt{2}}$ 3) $\sqrt{\frac{3}{4}}$ 4) $\sqrt{2}$

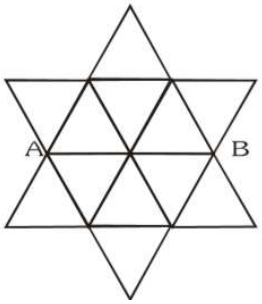
78. A wire of resistance 3ohm and length 10cm is stretched to length 30cm. assuming that it has a uniform cross section, what will be its new resistance?

1) 18Ω 2) 9Ω 3) 27Ω 4) 81Ω

79. A ray of light incident at an angle of incidence 48^0 on a prism of refracting angle 60^0 suffers minimum deviation. Calculate the angle of minimum deviation.

1) 12^0 2) 18^0 3) 36^0 4) 30^0

80. Find the equivalent resistance of the circuit between points A and B shown in figure is : (each branch is of resistance = 1Ω)



1) $\frac{22}{35}\Omega$ 2) $\frac{22}{31}\Omega$ 3) $\frac{35}{22}\Omega$ 4) $\frac{11}{15}\Omega$

81. Among the following which is correct increasing order of density of alkalimetals

1) $Li < K < Na < Rb$ 2) $K < Li < Na < Rb$ 3) $Na < K < Li < Rb$ 4) $Rb < K < Na < Li$

82. If in the future more elements are discovered (or) artifially synthesized, then the element with the atomic number 165 will be

1) Carbon family 2) Nitrogen family 3) Oxygen family 4) None

83. Which is double acid anhydride of nitrous acid and nitric acid

1) NO 2) N_2O 3) NO_2 4) N_2O_5

84. The one which is composed of all the three kinds of bonds (ionic bond, covalent bond and dative bond)

1) Sodium chloride 2) Ammonia

3) Carbon tetrachloride 4) Ammonium chloride

85. There are three elements E, F, G with atomic number 20, 8, 17. Give the molecular formula of the compound formed between E and G and mention the type of chemical bond

1) EG, covalent 2) EG, ionic bond 3) EG_2, covalent 4) EG_2, Ionic bond

86. Initially 3 moles of Acetic acid dissociated to give 0.1 mole H^+ and 0.1 mole CH_3COO^-. Calculate degree of ionisation of acetic acid

1) 33.3% 2) 3.33% 3) 66.6% 4) 6.66%

87. The salt solution which does not react with ammonium hydroxide is

1) Calcium nitrate 2) Zinc nitrate 3) Lead nitrate 4) Copper nitrate

88. If 6 litres of hydrogen and 5.6 litres of chlorine are mixed and exploded, what will be the volume of hydrogen in the resulting gaseous mixture?

1) 11.6L 2) 11.2L 3) 0.4L 4) 22.4L

89. The main ore of zinc is zinc blende, what is its formula

1) ZnO 2) ZnS 3) $ZnCO_3$ 4) $ZnSO_4$

90. The mineral acid, which is prepared by heating NaCl with concentrated H_2SO_4. Lavoisier named it as "muriatic acid". What is its formula

1) H_2SO_4 2) H_2SO_3 3) $HClO_4$ 4) HCl

91. The chemical used in the brown ring test is

1) $CuSO_4$ 2) $ZnSO_4$ 3) $FeSO_4$ 4) $Fe_2(SO_4)_3$

92. Based on given equation, identify, "X" and its colour

$K_2Cr_2O_7 + H_2SO_4 + 3SO_2 \rightarrow X + K_2SO_4 + H_2O$

1) K_2CrO_4 – Orange 2) $Cr_2(SO_4)_3$ – Green

3) $CrSO_4$ – Yellow 4) CrO_5 – Red

93. One mole of magnesium in the vapour state absorbed 1200KJ of energy. If the first and second ionization energies of magnesium are 750 and 1450KJ/mole respectively, the final composition of the mixture is

1) 69%Mg^{+}, 31%Mg^{+2} 2) 59%Mg^{+}, 41%Mg^{+2}

3) 49%Mg^{+}, 51%Mg^{+2} 4) 29%Mg^{+}, 71%Mg^{+2}

94. Among

a) Na_2O b) MgO c) Al_2O_3 d) P_2O_5 and e) Cl_2O_7

the most basic Most acidic and amphoteric, oxide can be respectively

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

95. The correct sequence of increasing covalent character is represented by

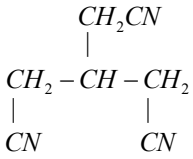
1) $BeCl_2 < NaCl < LiCl$ 2) $BeCl_2 < LiCl < NaCl$

3) $NaCl < LiCl < BeCl_2$ 4) $LiCl < NaCl < BeCl_2$

96. The ratio of mass percent of C and H of an organic compound $(C_xH_yO_z)$ is 6 : 1. If one molecule of the above compound $(C_xH_yO_z)$ contains half as much oxygen as required to burn one molecule of compound C_xH_y completely to CO_2 and H_2O. The empirical formula of compound $C_xH_yO_z$ is

1) $C_2H_4O_3$ 2) $C_3H_6O_3$ 3) C_2H_4O 4) $C_3H_4O_2$

97. What is the IUPAC name



1) butane – 1, 2, 3 – tricarbonitrite 2) 3-cyano methyl pentane – 1, 5 - dinitrite

3) 2-cyano methyl propane 1, 3-dicarbonitrile 4) butane tricyanide

98. What is $\left[H^{+}\right]$ of a solution that is 0.01M in HCN and 0.02M in NaCN?

$\left(Ka \text{ for } HCN = 6.2\times10^{-10}\right)$

1) 3.1×10^{10} 2) 6.2×10^{5} 3) 6.2×10^{-10} 4) 3.1×10^{-10}

99. 

1) Position isomers 2) Chain isomers

3) Functional isomers 4) Metamers

100. During the electrolysis of copper sulphate aqueous solution using copper electrode, the reaction taking place at the cathode is

1) $Cu \rightarrow Cu^{+2}_{(aq)} + 2e^{-}$ 2) $Cu^{+2}_{(aq)} + 2e^{-} \rightarrow Cu_{(s)}$

3) $H^{+}_{(aq)} + e^{-} \rightarrow \frac{1}{2}H_{2(g)}$ 4) $SO^{-2}_{4(aq)} \rightarrow SO_{3(g)} + \frac{1}{2}O_{2(g)} + 2e^{-}$

THE END