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

WRONG METHOD OF BUBBLING

INTO 10+1-ICSE
MATHEMATICS

1. The largest value of x for which $2(x-1) \le 9-x$ *and* $x \in W$ is

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

2. Three smallest consecutive whole numbers such that the difference between one-fourth of the largest and one-fifth of the smallest is at least 3 is

   1) 50,51,52 2) 51,52,53 3) 52,53,54 4) 53,54,55

3. Let $A=\begin{bmatrix} x & 1 \\ 1 & 0 \end{bmatrix}$, $x \in R$ *and* $A^4 = \left[a_{ij}\right]_{2\times 2}$, if $a_{11}=109$, then a_{22} is equal to

   1) 10 2) 20 3) 30 4) 406

4. When the polynomial $2x^3 - kx^2 + (5k-3)x - 8$ is divided by $x-2$, the remainder is 14. Find the value of 'k'

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

5. If $\begin{bmatrix} 3 & -8 \\ 9 & 4 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -2 \\ 8 \end{bmatrix}$, Then $x+y=$

   1) $\frac{7}{6}$ 2) $\frac{6}{7}$ 3) $\frac{1}{6}$ 4) $\frac{5}{6}$

6. If $B=\begin{bmatrix} 2 & 1 \\ 0 & 1 \end{bmatrix}$ *and* $B^2 = B + \frac{1}{2}A$. Then matrix A =

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

7. How many terms of the A.P. 43, 39, 35, ……..be taken so that their sum is 252?

1) 4 2) 8 3) 12 4) 16

8. If the first two consecutive terms of a G.P. are 125 and 25, then its 6^{th} term.

1) $\frac{1}{625}$ 2) $\frac{1}{75}$ 3) $\frac{1}{5}$ 4) $\frac{1}{25}$

9. The sum of 8 terms of the G.P.: $3+6+12+24+.....$ is

1) 765 2) 865 3) 965 4) 665

10. If the point $A(3,-5)$ is reflected in the point $P(-4,3)$ as point B'. Then the co-ordinates of point B'

1) $(11,11)$ 2) $(-11,11)$ 3) $(-11,-11)$ 4) $(11,-11)$

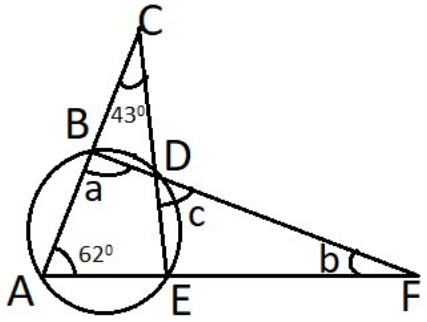
11. The slope and $y-$intercept of the line $2x-3y-4=0$ is

1) $\frac{2}{3},\frac{4}{3}$ 2) $-\frac{2}{3},\frac{4}{3}$ 3) $\frac{2}{3},-\frac{4}{3}$ 4) $-\frac{2}{3},-\frac{4}{3}$

12. The sum of 10 terms of the series $\frac{3}{1^2\times 2^2}+\frac{5}{2^2\times 3^2}+\frac{7}{3^2\times 4^2}+.....is:$

1) 1 2) $\frac{120}{121}$ 3) $\frac{99}{100}$ 4) $\frac{143}{144}$

13. In the given figure, if $\angle ACE=43^0$ and $\angle CAF=62^0$, then $a+b+c=$ _____



1) 180^0 2) 70^0 3) 80^0 4) 40^0

14. When x^3+x^2-4x-4 is divided by $(x+1)$ the quotient is

1) x^2-1 2) x^2+4 3) x^2-4 4) x^2+1

15. The quadratic function in x such that when it is divided by $x-1,x-2,x-3$ leaves remainders $1,2,4$ respectively is

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

16. If α,β are roots of $x^2+2x+1=0$ then $\alpha^{2025}+\beta^{2025}=$

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

17. $a^3+b^3=4, ab=\frac{2}{3}$, find $a+b=?$

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

18. If $x^y + y^x = 18$ then $x + y =$ _____

1) 16 2) 17 3) 18 4) 19

19. The roots of $2x^2 - 3x + 5 = 0$ are

1) Rational and equal 2) Rational and not equal

3) Irrational 4) Not real

20. How many integers *x* satisfying the equation $\left(x^2 - x - 1\right)^{x+2} = 1$?

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

21. The sum of the reciprocals of Rehman's ages 3 years ago and 5 years from now is $\frac{1}{3}$.

His present age is

1) 5 2) 6 3) 7 4) 8

22. The roots of the equation $a(b-c)x^2 + b(c-a)x + c(a-b) = 0$

1) $ab + bc + ca, 1$ 2) $a + b + c$, ab+ bc+ ca

3) $1, \frac{c(a-b)}{a(b-c)}$ 4) $\frac{b(c-a)}{a(b-c)}$

23. The sum of *n* terms in two A.P's are in the ratio $3n + 1 : n + 4$, then the ratio of 4^{th} terms is

1) 13 : 8 2) 2 : 1 3) 27 : 7 4) 13 : 22

24. If the geometric mean between *a and b is* $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$, then $n =$

1) 0 2) $1/2$ 3) $-1/2$ 4) $1/2$

25. If $\sec x + \sec^2 x = 1$ then the value of $\tan^8 x - \tan^4 x - 2\tan^2 x + 1$ will be equal to

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

26. The point which divides the join of $(-1, 7)$ *and* $(4, -3)$ in the ratio $2 : 3$ is

1) $(1, 3)$ 2) $(1, -3)$ 3) $(-1, 3)$ 4) $(-1, -3)$

27. The slope of the line joining the points $(2a, 3b), (a, -b)$ is

1) $\frac{4a}{b}$ 2) $\frac{a}{4b}$ 3) $\frac{4b}{a}$ 4) $\frac{b}{4a}$

28. The centroid divides each median in the ratio of

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

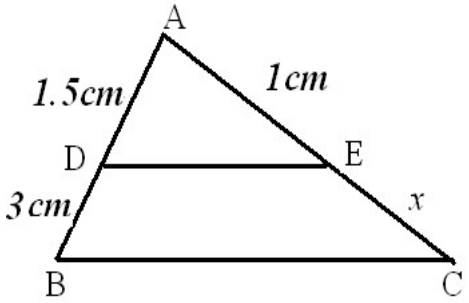
29. If $\sin^2\theta = \frac{x^2 + y^2 + 1}{2x}$, then *x* must be

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

30. $\Delta ABC \sim \Delta PQR$, if $\angle A = 50^0$, *then* $\angle Q + \angle R =$

1) 130^0 2) 40^0 3) 80^0 4) 140^0

31. In the following figure $\overline{DE} \| \overline{BC}$, then EC _____

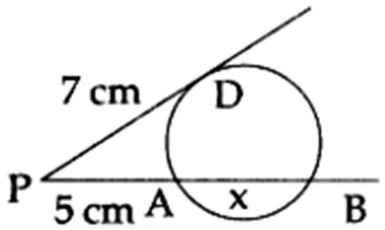


1) 4 2) 3 3) 2 4) 1

32. PQ is a chord of length 8cm of circle of radius 5cm. The tangents at P and Q intersect a point T. Then the length TP =

1) 5 cm 2) 8 cm 3) 13/2 cm 4) 20/3 cm

33. In the adjacent figure, x =



1) 5.8 cm 2) 6.8 cm 3) 4.8 cm 4) 3.8 cm

34. A right circular cylinder has radius 14cm and height 21cm. The curved surface area is

1) 1848 cm^2 2) 616 cm^2 3) 3080cm^2 4) 12936 cm^2

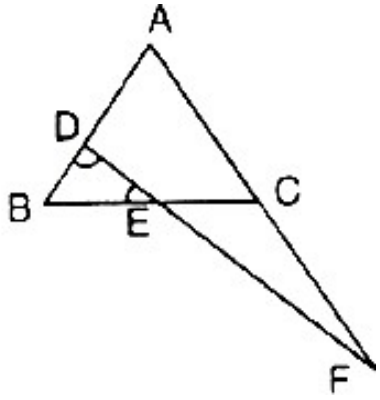
35. Metallic spheres of radius 6cm, 8cm and 10cm respectively are melted to form a single solid sphere. The radius of the resulting sphere is

1) 12cm 2) 15cm 3) 18cm 4) 24cm

36. Two cubes each of volume 64cm^3 are joined end to end together. The surface area of the resulting cuboid is

1) 80 cm^2 2) 160 cm^2 3) 240 cm^2 4) 320 cm^2

37. In the figure $\angle BED = \angle BDE$ *and* E is the middle point of BC. Then



1) $\frac{AF}{CF} = \frac{AD}{BE}$ 2) $\frac{AF}{CF} = \frac{BE}{AD}$ 3) $\frac{CF}{AF} = \frac{BE}{AD}$ 4) None of these

38. The sharpened edge of the pencil gives an idea about the

1) Circle 2) Cone 3) Rectangle 4) Square

39. If $\tan(A+B)=\sqrt{3}, \tan A=1,$ *then* $B=$

1) 15^0 2) 30^0 3) 45^0 4) 60^0

40. If $15\sin^4\alpha+10\cos^4\alpha=6,$ then $27\sec^6\alpha+8\operatorname{cosec}^6\alpha=$

1) 500 2) 250 3) 400 4) 350

41. If $\tan\theta=\cot\theta$ then the value of $\sec\theta$ = _____

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

42. Length of the shadow of a 15 meter high pole is $5\sqrt{3}$ meters at 7 O = clock in the morning. The angle of elevation of the Sun rays with the ground at the time is

1) 30^0 2) 45^0 3) 60^0 4) 90^0

43. Two poles of height 6m and 11m stand on a plain ground and the distance between their feet is 12m, then the distance between their tops is

1) 11 2) 12 3) 13 4) 14

44. The probability of drawing out a red king from a deck of cards is

1) 1/4 2) 1/13 3) 1/26 4) 1/52

45. The probability of getting 53 Fridays in a Leap year is

1) 1/7 2) 2/7 3) 3/7 4) 4/7

46. A dice is thrown twice. Then the probability of that '5' will come up at least once.

1) $\frac{11}{36}$ 2) $\frac{25}{36}$ 3) $\frac{23}{36}$ 4) $\frac{12}{36}$

47. If the mean of $p, \frac{1}{p}$ is q, then the mean of $p^3, \frac{1}{p^3}$ is

1) $8q^3-3q$ 2) $\frac{8q^3-3q}{2}$ 3) q^3+3 4) $4q^3-3q$

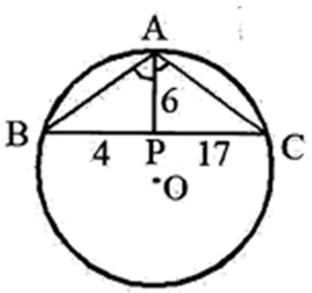
48. The median of $86, 24, 91, 47, 38, 62, 48, 74, 28, 6$ is

1) 48 2) 56 3) 47.5 4) 38

49. Mode of A, B, C, D…….Z is

1) 20 2) 21 3) 22 4) No mode

50. Points A, B ,C on a circle. The line $AP \perp BC$. If AP = 6. BP =4 and CP =17, find the radius of the circle.



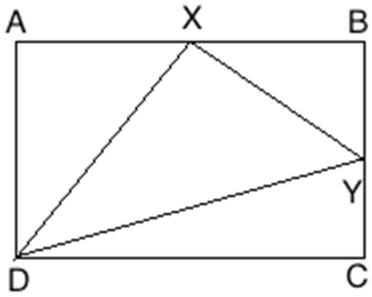
1) $\frac{65}{3}$ 2) $\frac{65}{6}$ 3) $\frac{65}{2}$ 4) $\frac{65}{4}$

ARITHMETIC AND LOGICAL REASONING QUESTIONS:

51. If $x+y+z=2024, xy+yz+zx=4045$ then what is the value of $\frac{1}{1-x}+\frac{1}{1-y}+\frac{1}{1-z}$

1) $\text{Cos } 0^0$ 2) $\text{Cos } 30^0$ 3) $\text{Cos } 45^0$ 4) $\text{Cos } 60^0$

52. ABCD is *a* rectangle and lines DX, DY and XY are drawn as shown. Area of Δ AXD is 5, Area of ΔBXY is 4 and area of ΔCYD is 3. If the area of DXY can be expressed as $\sqrt{x}$ where $x \in N$ then is equal to



1) 72 2) 75 3) $2x^2 = a+b$ 4) None

53. The numbers a,b,c are the digits of three digit number which satisfy $49a+7b+c=286$. What is the value of $2023a+2024b+2025c$?

1) 33384 2) 32385 3) 34385 4) 35385

54. If '$-$' stands for '$\div$', '+'stands for '$\times$', '$\div$' stands for '$-$' and '$\times$'stands for '+', then which of the following equations is correct?

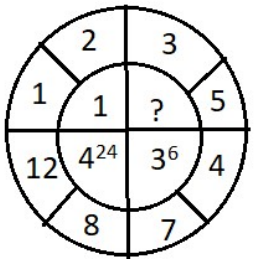
1) $30-6+5\times4\div2=27$ 2) $30+6-5\div4\times2=30$

3) $30\times6\div5-4+2=32$ 4) $30\div6\times5+4-2=40$

55. Find the last digit of $1^5+2^5+.....+99^5$

1) $\text{Sin } 0^0$ 2) $\text{Sin } 30^0$ 3) $\text{Sin } 45^0$ 4) $\text{Sin } 90^0$

56. The missing value in the following figure is



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

57. Pointing to a photograph of a boy Suresh said, "He is the son of the only son of my mother." How is Suresh related to that boy?

1) Brother 2) Uncle 3) Cousin 4) Father

58. Find the remainder when 4333^3 is divided by 9

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

59. If $a^2=b+c, b^2=a+c, c^2=a+b$ *then* $\frac{1}{a+1}+\frac{1}{b+1}+\frac{1}{c+1}$ is?

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

60. The set of perfect squares $\{1^2, 2^2, 3^2 .....\}$ is divided into groups follows

$G_1 = \{1^2\}$

$G_2 = \{2^2, 3^2, 4^2\}$

$G_3 = \{5^2, 6^2, 7^2, 8^2, 9^2\}$

Find the first number in G_{100}.

1) 98^2 2) 99^2 3) 100^2 4) 101^2

PHYSICS

61. Calculate the power of an engine required to lift 10^5kg of coal per hour from a mine 360m deep. (Take g = 10m s^{-2})

1) 80kW 2) 100kW 3) 120kW 4) 130kW

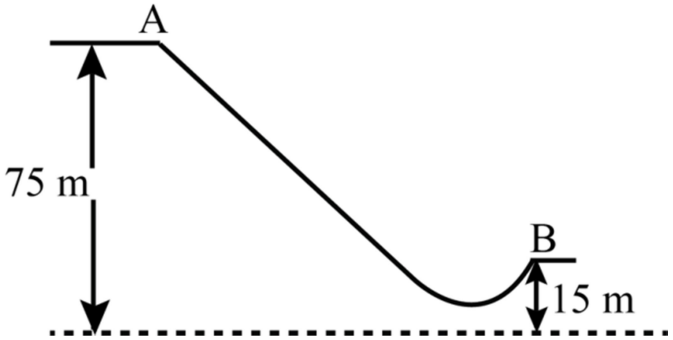
62. How fast should a man weighing 600N run so that his kinetic energy is 750J? (g = 10m s^{-2})

1) 3ms^{-1} 2) 4ms^{-1} 3) 5ms^{-1} 4) 6ms^{-1}

63. A spring is kept compressed by a toy cart of mass 150g. On releasing the cart, it moves with a speed of 0.2m s^{-1}. Calculate the potential energy (elastic) of the spring

1) 3×10^{-3}J 2) 5×10^{-3}J 3) 7×10^{-3}J 4) 9×10^{-3}J

64. The diagram given below shows a ski jump. A skier weighing 60kgf stands at A at the top of ski jump. He moves from A and takes off for his jump at B. Calculate the change in the gravitational potential energy of the skier between A and B



1) 4.6×10^4J 2) 3.6×10^4J 3) 5.6×10^4J 4) 6.6×10^4J

65. A machine is driven by a 100kg mass that falls 8.0m in 4.0s. It lifts a load of mass 500kg vertically upwards. Taking g = 10m s^{-2}, calculate
(a) the work done by the falling mass in its displacement by 8.0m
(b) the power input to the machine

1) 2000J, 8000W 2) 8000J, 2000W 3) 1000J, 4000W 4) 4000J, 1000W

66. Select the incorrect statement
1) A machine always has efficiency less than 100%
2) The mechanical advantage of a machine can be less than 1
3) A machine can be used as a speed multiplier
4) A machine can have mechanical advantage greater than its velocity ratio

67. A ray of light of wavelength $5400\,\text{Å}^0$ suffers refraction from air to glass. Taking ${}_a\mu_g = 3/2$, find the wavelength of light in glass

1) $4400\,\text{Å}^0$ 2) $3600\,\text{Å}^0$ 3) $3400\,\text{Å}^0$ 4) $4600\,\text{Å}^0$

68. What should be the angle of incidence for a ray of light which suffers minimum deviation of 36^0 through an equilateral prism?

1) 46^0 2) 42^0 3) 45^0 4) 48^0

69. A coin kept inside water $(\mu = 4/3)$ when viewed from air in a vertical direction, appears to be raised by 2.0mm. Find the depth of the coin in water

1) 8.0mm 2) 7.0mm 3) 6.0mm 4) 9.0mm

70. The correct lens formula is

1) $\frac{1}{u}+\frac{1}{v}=\frac{1}{j}$ 2) $\frac{1}{u}-\frac{1}{v}=\frac{1}{f}$ 3) $f=\frac{uv}{u-v}$ 4) $f=\frac{u+v}{uv}$

71. The maximum magnifying power of a convex lens of focal length 5cm can be

1) 25 2) 10 3) 1 4) 6

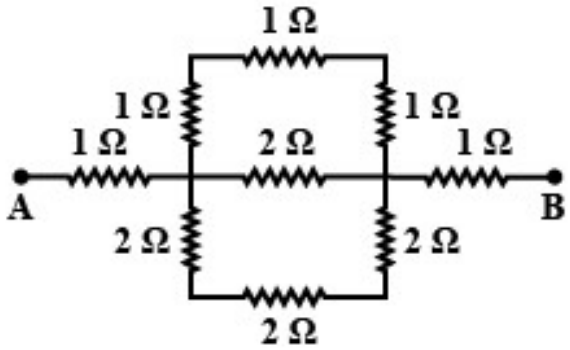
72. The ratio of amplitudes of two waves is 3:4. Find the ratio of their loudness

1) 9 : 16 2) 8 : 16 3) 6 : 16 4) 10 : 16

73. 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?

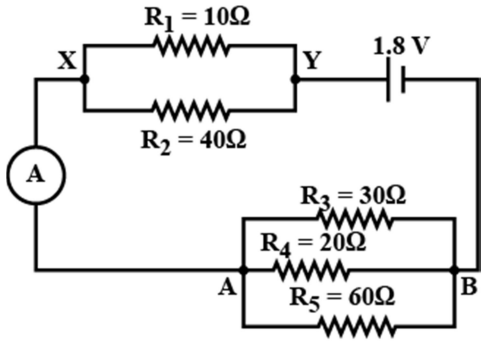
1) 28Ω 2) 27Ω 3) 25Ω 4) 24Ω

74. Calculate the effective resistance between the points A and B in the circuit



1) 2Ω 2) 5Ω 3) 4Ω 4) 3Ω

75. The diagram below in shows the arrangement of five different resistances connected to a battery of emf 1.8V calculate



(a) The total resistance of the circuit, and

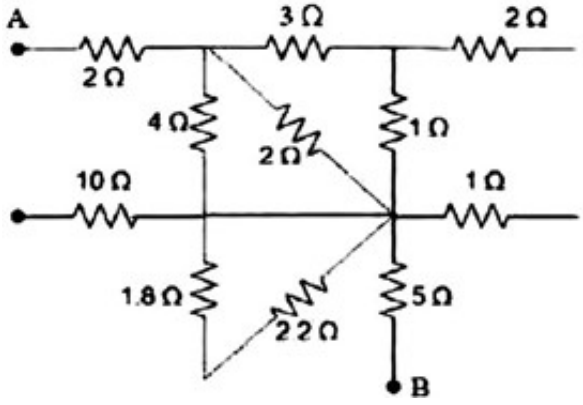
(b) The reading of ammeter A

1) 18Ω, 0.1A 2) 1Ω, 18A 3) 8Ω, 0.1A 4) 18Ω, 0.2A

76. An electrical appliance having a resistance of 200Ω is operated at 200V. Calculate the energy consumed by the appliance in 5minuts in kWh

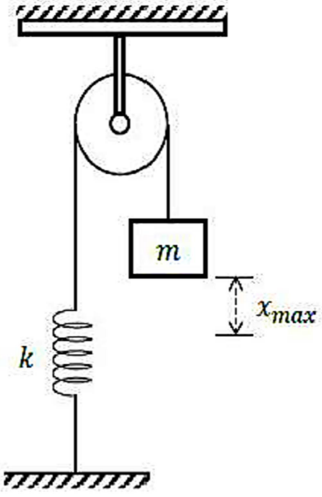
1) 0.0147kWh 2) 0.0157kWh 3) 0.0167kWh 4) 0.0167kWh

77. What is the equivalent resistance between the points A and B of the network.



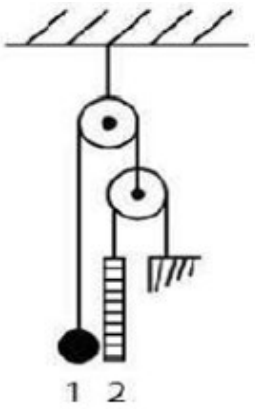
1) $\frac{57}{7}\Omega$ 2) 8Ω 3)6Ω 4) $\frac{57}{5}\Omega$

78. Consider the situation shown in figure. Initially the spring is unstretched. When the system is released from rest, assuming no friction in the pulley, find the maximum elongation of the spring.



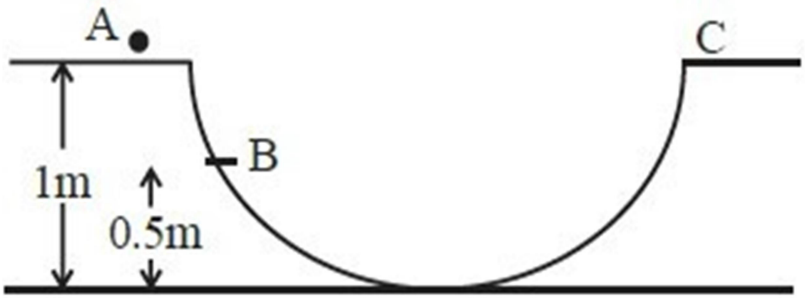
1) $\frac{mg}{k}$ 2) $\frac{2mg}{k}$ 3) $\frac{3mg}{k}$ 4) $\frac{4mg}{k}$

79. In the pulley system, the mass of ball is 1.2 times greater than the mass of the rod. The length of the rod is 50 cm. The ball is set on the same level as the lower end of the rod and then released. What is the acceleration of the rod with which it comes down? Assume the pulleys and threads are massless and friction force is neglected. (Use g = 10 m/s^2)



1) g 2) g/3 3)g/2 4) 2g/3

80. A particle is placed at the point A of a frictionless track ABC as shown in figure. It is gently pushed toward right. The speed of the particle when it reaches the point B is: (Take g = 10 m/s^2).



1) 20 m/s 2) $\sqrt{10}$ m/s 3) $2\sqrt{10}$ m/s 4) 10 m/s

CHEMISTRY

81. An element A belonging to period 3 and group IIA will have,

1) 3 shells and 2 valence electrons

2) 2 shells and 3 valence electrons

3) 3 shells and 3 valence electrons

4) 2 shells and 2 valence electrons

82. M is a metal above hydrogen in the activity series and its oxide has the formula M_2O. This oxide when dissolved in water forms the corresponding hydroxide which is a good conductor of electricity based on the above context, the number of electrons in the outermost shell of M?

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

83. Element A has 2 electrons in its M shell. Element B has atomic number 7. If the compound formed between A and B is melted and an electric current is passed through the molten compound, the element A will be obtained at the _____ and B at the _____ of the electrolytic cell respectively.

1) Cathode, cathode 2) Anode, anode 3) Cathode, anode 4) Anode, cathode

84. Solution P has a pH of 13, solution Q has a pH of 6 and solution R has a pH of 2. Which solution contains molecules as well as ions?

1) Solution : R 2) Solution : P 3) Solution : Q 4) Solution : P, Q, R

85. $Ca(H_2PO_4)_2$ is an example of salt

1) Acidic salt 2) Basic salt 3) Double salt 4) Normal salt

86. What do you observe when freshly precipitated aluminium hydroxide reacts with caustic soda solution?

1) Blue salt of sodium meta aluminate is formed
2) Green salt of sodium meta aluminate is formed
3) White salt of sodium meta aluminate is formed
4) Yellow salt of sodium meta aluminate is formed

87. Calculate the total number of electrons present in 1.6 grams of methane

1) 4×10^{23} 2) 9×10^{23} 3) 7×10^{23} 4) 6.023×10^{23}

88. A compound is formed by 24g of X and 64g of oxygen. If atomic mass of $X=12$ *and* $O=16$, calculate the simplest formula of the compound.

1) XO_2 2) X_2O_3 3) X_2O_5 4) XO_3

89. A solution contains magnesium ions $\left(Mg^{2+}\right)$, iron (II) ions $\left(Fe^{2+}\right)$ and copper ions $\left(Cu^{2+}\right)$. On passing an electric current through this solution, which ions will be the first to be discharged at the cathode?

1) Mg^{+2} 2) Fe^{+2} 3) Cu^{+2} 4) Mg^{+2}

90. Identify the weak electrolyte from the following

1) Sodium chloride solution 2) Dilute hydrochloric acid
3) Dilute sulphuric acid 4) Aqueous Acetic acid

91. Froth floatation process is generally used to concentrate _____ores

1) Sulphide 2) Magnetite 3)Bauxite 4) Red hematite

92. Heating an ore in a limited supply of air (or) in the absence of air at a temperature just below its melting point is known as

1) Smelting 2) Ore dressing 3)Calcination 4) Bessemerisation

93. In period 3 of the Periodic Table, element B is placed to the left of element A. On the basis of this information,

The element B would have _____metallic character than A.

1) Lower 2) Higher 3)Very low 4) Both 1 and 3

94. The following table shows the electronic configuration of the elements W, X, Y, Z:

Element	W	X	Y	Z
Electronic configurations	2, 8, 1	2, 8, 7	2, 5	1

What is the formula of the compound formed between:
X and Z

1) X_2Z 2) X_2Z_3 3) XZ 4) XZ_2

95. The preparation of lead sulphate from lead carbonate is a two-step process. (lead sulphate cannot be prepared by adding dilute sulphuric acid to lead carbonate.)
What is the first step that is required to prepare lead sulphate from lead carbonate?

1) Reacting lead carbonate with dilute nitric acid to produce lead nitrate, water and carbondioxide
2) Reacting lead nitrate with sulphuric acid to produce lead sulphate and nitric acid
3) Both (1) and (2)
4) lead sulphate can be prepared by adding manganese dioxide to lead carbonates

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

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

97. If 6 litres of hydrogen and 4 litres of chlorine are mixed and exploded and if water is added to the gases formed, find the volume of the residual gas.

1) 4 litres 2) 8 litres 3) 2 litres 4) 10 litres

98. A gas cylinder filled with hydrogen holds 50g of the gas. The same cylinder holds 200g of a gas X and 500 g of gas Y. Considering the same conditions of temperature and pressure in the cylinder, calculate the relative molecular masses of gases X and Y.

1) 8, 20 2) 30, 40 3) 40, 8 4) 50, 20

99. Cost of sugar $\left(C_{12}H_{22}O_{11}\right)$ *is* Rs.40 per kg; calculate its cost per mole

1) Rs.17.1 per mole 2) Rs.27.1 per mole 3) Rs.13.69 per mole 4) Rs. 35.5 per mole

100. Among second period elements the one which has highest electron affinity is

1) Lithium 2) Carbon 3) Fluorine 4) Neon

THE END