INTO 10TH STATE

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

MATHEMATICS

1. The radical form of $15^{\frac{2}{3}}$ is _____

   1. $\sqrt[3]{25}$ 2. $\sqrt{225}$ 3. $\sqrt[3]{15}$ 4. $\sqrt[3]{225}$

2. $\sqrt[4]{81} - 8\sqrt[3]{343} + 15\sqrt[5]{32} + \sqrt{225} =$ _____

   1. 8 2. - 8 3. 5 4. Does not exist

3. If n is even, then the remainder when $(x^n - 1)$ is divided by $(x + 1)$ is _____

   1. - 1 2. 1 3. 0 4. $(x^n - 1)$ is not divisible by $(x + 1)$

4. $x^3 + y^3 + z^3 - 3xyz = \frac{1}{2}(x+ y + z)p$ then p = _____

   1. $(x - y)^2 + (y - z)^2 + (z - x)^2$ 2. $(x + y)^2 + (y + z)^2 + (z + x)^2$
   3. $(x - y)^2 + (y - z)^2 - (z - x)^2$ 4. $(x + y)^2 + (y + z)^2 - (z - x)^2$

5. If $(x^2 - 1)$ is a factor of $ax^4 + bx^3 + cx^2 + dx + e$ then a + c + e = _____

   1. b – d 2. b + d 3. d – b 4. 1

6. The word geometry is derived from _____

   1. Greek 2. Latin 3. English 4. Sanskrit

7. The number of dimensions of a solid is _____

   1. 2 2. 1 3. 0 4. 3

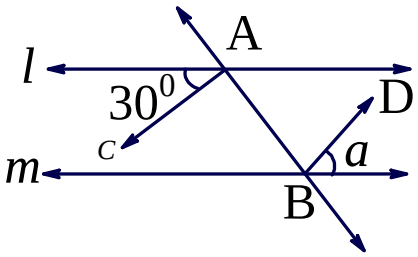
8. The angle between two hands of a clock when the time in the clock is 7:00 PM is _____

   1. 360^0 2. 90^0 3. 0^0 4. 210^0

9. The number of solutions in positive integers of $2x + 3y = 24$ is

   1. 1 2. 2 3. 3 4. 4

10. In the figure $l \parallel m$ and n is a transversan and $\overrightarrow{AC}$ and $\overrightarrow{BD}$ are the bisectors to interior angles $\angle A$ and $\angle B$, then the value of 'a' is



1. 60^0 2. 30^0
3. 150^0 4. 330^0

11. Number of primes from 900 to 1000 is
1. 14 2. 15 3. 13 4. 12

12. If $x < 0, y > 0$ then $(-x, -y)$ lies in _____
1. 1st quadrant 2. 2nd quadrant 3. 3rd quadrant 4. 4th quadrant

13. If the distance of a point from x-axis is 8 and its distance from y-axis is 3 then the point is denoted by _____
1. (8, 3) 2. (-8, 3) 3. (-3, 8) 4. (3, 8)

14. The equation of line parallel to x-axis and passing through (2, -5) is _____
1. $y + 5 = 0$ 2. $y + 2 = 0$ 3. $x + 5 = 0$ 4. $y - 5 = 0$

15. ΔABC is isosceles with sides AB = AC and AD is the altitude. If $\angle BAD = 50^0$ then $\angle ACD =$ _____
1. 50^0 2. 40^0 3. 30^0 4. 90^0

16. If two sides of a triangle are 8cm and 13cm then the third side lies between _____
1. 8 and 13 2. 13 and 8 3. 5 and 21 4. 0 and 21

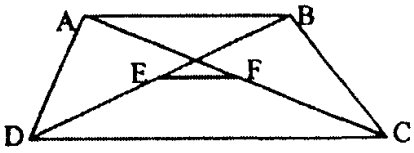
17. In a parallelogram if one angle is 24^0 less than the twice of the smallest angle. Then the angles of a parallelogram are
1. $68^0, 112^0, 68^0, 112^0$ 2. $60^0, 120^0, 60^0, 120^0$
3. $60^0, 30^0, 90^0, 90^0$ 4. $90^0, 90^0, 90^0, 90^0$

18. In ΔABC, BC = 8 and D, E are the mid points of AB and AC. Also AF = $\frac{1}{2}$ AD and AG = $\frac{1}{2}$ AE then FG = _____
1. 4 2. 32 3. 3 4. 2

19. The four angles of a quadrilateral are in the ratio of 1 : 2 : 3 : 4. Then the greatest angle is _____
1. 144^0 2. 150^0 3. 360^0 4. 100^0

20. The figure formed by joining the mid points of sides of a rhombus is _____
1. Rhombus 2. Rectangle 3. Parallelogram 4. Square

21. In the trapezium shown, AB || DC, and E and F are the midpoints of the two diagonals if DC = 60 and EF = 5 then the length of AB is equal to :



1. 40 2. 45 3. 50 4. 55

22. Mean of the data 8, 7, 6, 14, 12, 10, 20, 16, 15 and 14 is 12.2. If each observation is multiplied by 2 and then 3 is added, the new mean is _____
1. 38.6 2. 61 3. 27 4. 27.4

23. The median of first 25 natural numbers is _____
1. 13 2. 25 3. 31 4. 52

24. A right circular cylinder just encloses a sphere of radius r. Then the ratio of surface area of the sphere and curved surface area of the cylinder is _____

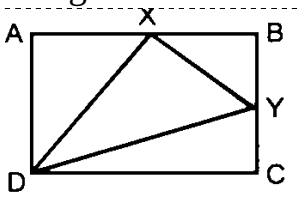
1. 2 : 1 2. 1 : 2 3. 1 : 1 4. 3 : 1

25. The volume of a pyramid is _____

1. $\frac{1}{3}$ × area of base × height 2. $\frac{1}{2}$ × area of base × height

3. Area of base × height 4. Perimeter of base × height

26. ABCD is *a* rectangle and lines DX, DY and XY are drawn as shown. Area of ΔAXD 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. 84 4. 96

27. If the radius of a sphere is doubled then its surface area becomes _____

1. 4 times 2. Twice 3. 8 times 4. Does not change

28. If 1 cm represents 2.5 m then area of a square with side 10m is _____

1. 16 cm^2 2. 4 cm^2 3. 2.5 cm^2 4. 1 cm^2

29. Area of parallelogram is 64 cm^2 with base 16 cm. Then its height is _____

1. 3 cm 2. 4 m 3. 3 m 4. 4 cm

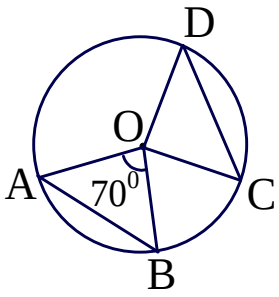
30. Let 'O' be the centre of a circle. The distance of chord AB from O is greater than the distance of chord CD from 'O' then

1. AB = CD 2. AB > CD 3. AB < CD 4. Diameter = AB + CD

31. Number of points required to describe a circle is _____

1. 1 2. 2 3. 3 4. Infinite

32. In the given figure, 'O' is the centre of the circle and AB, CD are equal chords. If $\angle AOB = 70^0$, then the angle of ΔOCD are



1. $70^0, 55^0, 55^0$ 2. $60^0, 60^0, 60^0$

3. $90^0, 45^0, 45^0$ 4. $50^0, 50^0, 80^0$

33. If in ΔABC, $\overrightarrow{BX}$ and $\overrightarrow{CY}$ are bisectors to the base angles then $\angle BXC$ = _____

1. $90^0 + \frac{1}{2}\angle A$ 2. $90^0 - \frac{1}{2}\angle A$ 3. $180^0 - \frac{1}{2}\angle A$ 4. None

34. A letter is chosen from English alphabet then the probability of a letter comes after 'p' is _____

1. $\frac{8}{13}$ 2. 1 3. $\frac{5}{26}$ 4. $\frac{5}{13}$

35. The sum of the probabilities of all outcomes of random experiment is always

1. 0 2. -1 3. 1 4. $\frac{1}{2}$

36. The probability of an event which is certain

1. 0 2. 1 3. -1 4. Can't say

37. The probability of drawing a prime number from a pack of cards numbered from 1 to 10

1. $\frac{2}{10}$ 2. $\frac{1}{10}$ 3. $\frac{5}{10}$ 4. $\frac{2}{5}$

38. God is immortal. Rama is a God; the conclusion based on these two statements

1. Rama is mortal 2. Rama is a God 3. God is Rama 4. Rama is immortal

39. The product of two consecutive even numbers is always divisible by _____

1. 3 2. 5 3. 4 4. 8

40. We prove the statement "Sum of interior angles of a triangle is 180" by

1. Counter example 2. Inductive reasoning
3. Deductive reasoning 4. None

41. If $a^x = \left(\frac{a}{k}\right)^y = k^m$ then $\frac{1}{x} - \frac{1}{y} =$

1. 0 2. 1 3. m 4. $\frac{1}{m}$

42. $x^{x\sqrt{x}} = \left(x\sqrt{x}\right)^x$ then x = _____

1. 0 2. $\frac{3}{2}$ 3. $\frac{2}{3}$ 4. $\frac{9}{4}$

43. $\sqrt{2}, \sqrt[3]{3}$ satisfy the following order

1. < 2. > 3. = 4. ≤

44. The number of zeros of $x^2 + 1$ is _____ in real number system

1. 2 2. 1 3. 0 4. Infinite

45. The value of $ax^2 + bx + c$ when $x = 0$ is 6. The remainder when dividing by $x + 1$ is 6. The remainder when dividing by $x + 2$ is 8. Then $a + b + c =$

1. 1 2. 6 3. 7 4. 8

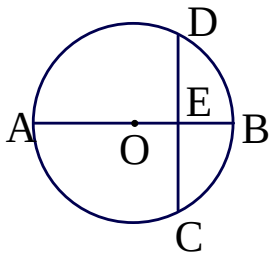
46. A root of the polynomial $x^{2017} + (-1)^{2017}$ is

1. 0 2. 1 3. -1 4. ±1

47. If $2^x + 3^y = 17, 2^{x+2} - 3^{y+1} = 5$ then

1. $x = 3, y = 2$ 2. $x = 3, y = 4$ 3. $x = 2, y = 3$ 4. $x = 4, y = 3$

48. If AB is the diameter of a circle with centre O. AE = 12, BE = 3 then CD=



1. 10 2. 12
3. 15 4. 9

49. A bag contains lemon flavoured candies only. Malini takes out one candy without looking into the bag. The probability that she takes out a lemon flavoured candy is

1. 0 2. $\frac{1}{2}$ 3. $\frac{1}{3}$ 4. 1

50. The probability of getting 6 or a number less than 6 in a single throw of a die is

1. 0 2. $\frac{1}{2}$ 3. $\frac{1}{3}$ 4. 1

51. If Arithmetic mean = 39, median = 37.5 then mode = _____

1. 38 2. 38.5 3. 34.5 4. 39.5

52. Which of the following is the "year of mathematics"

1. 2017 2. 2012 3. 2011 4. 1887

53. Each edge of a cube is increased by 50% then percentage increase in the surface area is _____

1. 125% 2. 2 times increased 3. Does not change 4. 50%

54. The diameter of a roller is 84 cm and its length is 120 cm. It takes 500 complete revolutions to roll once over the play ground to level. Then the area of the play ground in m^2 is _____

1. 15.84 m^2 2. 1584 m^2 3. 1584 cm^2 4. 15.84 cm^2

55. Express the following statement as a linear equation in two variables "Bhargavi got 10 more marks than double of the marks of Sindhu".

1. $2x + y + 10 = 0$ 2. $2x + y - 10 = 0$ 3. $2x - y + 10 = 0$ 4. $2x - y - 10 = 0$

56. Which of the following is not a solution of the equation $2x - 5y = 10$

1. (0, -2) 2. (5, 0) 3. $(2\sqrt{3}, -\sqrt{3})$ 4. $\left(1, \frac{-8}{5}\right)$

57. If $a^3 + b^3 + c^3 = 3abc$ then

1. $a + b + c = 0$ 2. $a = b = c$ 3. $a + b + c = 0$ (or) $a = b = c$ 4. $a \neq b \neq c$

58. $\frac{3.2^{n+1} + 2^n}{2^{n+2} - 2^{n-1}} =$

1. 0 2. 1 3. 2 4. 3

59. $(256)^{0.16} \cdot (256)^{0.09}$ = _____

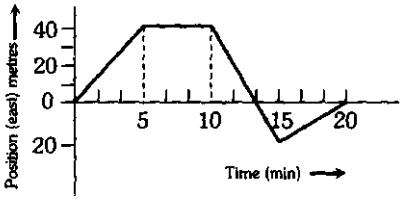
1. 8 2. 4 3. 2 4. 1

60. The quotient and remainder when $x^{2002} - 2001$ is divided by x^{91} are respectively

1. $x^{91\times 22}, 2001$ 2. $x^{91}, 2001$ 3. $x^{91\times 21}, -2001$ 4. $x^9, -2001$

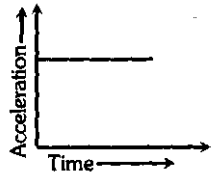
PHYSICS

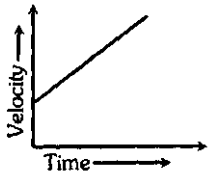
61. A boy begins to walk eastward along a street in front of his house and the graph of his position from home is shown in the following figure. His average speed for the whole time interval is equal to



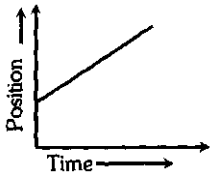
1. 8 m/min 2. 6 m/min 3. $\frac{8}{3}$ m/min 4. 2 m/min

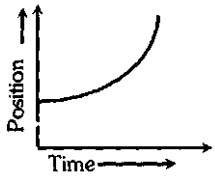
62. The velocity-time and acceleration-time graphs of a particle are given as

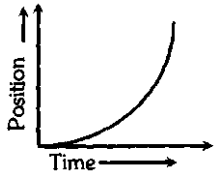


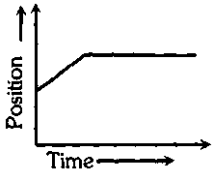


Its position-time graph may be given as

1. 

2. 

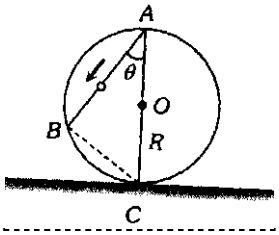
3. 

4. 

63. A frictionless wire AB is fixed on a sphere of radius R. a very small spherical ball slips on this wire. The time taken by this ball to slip from A to B is

1. $\frac{2\sqrt{gR}}{g\cos\theta}$ 2. $2\sqrt{gR}.\frac{\cos\theta}{g}$

3. $2\sqrt{\frac{R}{g}}$ 4. $\frac{gR}{\sqrt{g\cos\theta}}$



64. Work done by a frictional force is

1. Negative 2. Positive 3. Zero 4. All of the above

65. If the momentum of a body is increased by 100%, then the percentage increase in the kinetic energy is

1. 150% 2. 200% 3. 225% 4. 300%

66. If density of earth increased 4 times and its radius become half of what it is, our weight will

1. Be four times its present value 2. Be doubled 3. Remain same 4. Be halved

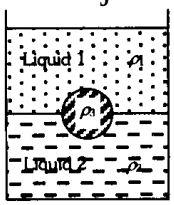
67. Weight of a body is maximum at

1. Moon 2. Poles of earth 3. Equator of earth 4. Centre of earth

68. A cube floats in water with 1/3rd part is outside the surface of water and it floats in liquid with 3/4th part is outside the liquid then the density of liquid is

1. 8/3 2. 2/3 3. 4/3 4. 5/3

69. A jar is filled with two non-mixing liquids 1 and 2 having densities ρ_1 and ρ_2 respectively. A solid ball, made of a material of density ρ_3, is dropped in the jar. It comes to equilibrium in the position shown in the figure. Which of the following is true for ρ_1, ρ_2 and ρ_3



1. $\rho_1 > \rho_3 > \rho_2$ 2. $\rho_1 > \rho_2 > \rho_3$

3. $\rho_1 < \rho_3 < \rho_2$ 4. $\rho_3 < \rho_1 < \rho_2$

70. Velocity of sound in air

I. increases with temperature II. Decreases with temperature

III. increase with pressure IV. Is independent of pressure

V. is independent of temperature

Choose the correct answer.

1. Only I and II are true 2. Only I and III are true

3. Only II and III are true 4. Only I and IV are true

71. The frequency of a tunning fork is 384 per second and velocity of sound in air is 352 m/s. How far the sound has transverse while fork completes 36 vibration

1. 3 m 2. 13 m 3. 23 m 4. 33 m

72. A body starts moving with a velocity $v_0=10ms^{-1}$. It experiences a retardation equal to $0.2v^2$. its velocity after 2s is given by

1. $+2\ ms^{-1}$ 2. $+4\ ms^{-1}$ 3. $-2ms^{-1}$ 4. $+6\ ms^{-1}$

73. A particle is falling freely under gravity. In first t second it covers distance x_1 and in the next t second it covers distances x_2, then t is given by

1. $\sqrt{\frac{x_2 - x_1}{g}}$ 2. $\sqrt{\frac{x_2 + x_1}{g}}$ 3. $\sqrt{\frac{2(x_2 - x_1)}{g}}$ 4. $\sqrt{\frac{2(x_2 + x_1)}{g}}$

74. A force F_1 accelerates a particle from rest to a velocity v. another force F_2 decelerates the same particle from v to rest, then
1. F_1 is always equal to F_2
2. F_2 is greater than F_1
3. F_2 may be smaller than, greater than or equal to F_1
4. F_2 cannot be equal to F_1

75. An open knife of mass m is dropped from a height h on a wooden floor. If the blade penetrates up to the depth d into the wood, the average resistance offered by the wood to the knife edge is
1. $mg\left(1+\frac{h}{d}\right)$ 2. $mg\left(1+\frac{h}{d}\right)^2$ 3. $mg\left(1-\frac{h}{d}\right)$ 4. $mg\left(1+\frac{d}{h}\right)$

76. If R is the radius of the earth and g the acceleration due to gravity on the earth's surface, the mean density of the earth is
1. $4\pi g/3gR$ 2. $3\pi R/4gG$ 3. $3g/4\pi RG$ 4. $\pi RG/12G$

77. There is no atmosphere on the moon because
1. It is close to the earth
2. It revolves round the earth
3. The escape velocity of the gas molecules is less than their rms velocity on the moon
4. The escape velocity of the gas molecules is more than their rms velocity on the moon.

78. Choose the correct statement
1. Sound waves are transverse waves
2. Sound travels faster through vacuum
3. Sound travels faster in solids than in gases
4. Sound travels faster in gases than in liquids

79. A stone is dropped into a well. If the depth of water below the top be h and velocity of sound is v then the splash in water is heart after T sec. then
1. $T=\sqrt{\left(\frac{2h}{g}\right)}+\frac{h}{v}$ 2. $T=2\sqrt{\left(\frac{2h}{g}\right)}$ 3. $T=\frac{2h}{v}$ 4. $T=\sqrt{\left(\frac{2h}{g}\right)}\times\frac{h}{v}$

80. The minimum distance to hear echo (speed of sound in air is 340 m/s)
1. 15m 2. 16m 3. 17m 4. 18m

CHEMISTRY

81. The gas that diffuses from lungs to blood is
1. Oxygen 2. Carbondioxide 3. Hydrogen 4. Helium

82. Volume of water shinks between _____
1. 0^0C to 4^0C 2. 50^0C to 100^0C 3. 60^0C to 70^0C 4. 100^0C to 120^0C

83. The reason for high rate of diffusion in gas is
1. Higher speed of gas particles 2. Greater space between gas particles
3. Both A and B 4. high viscosity

84. Oxygen and carbon dioxide from atmosphere diffuse and dissolve in water is essential for survival of _____
1. Human beings 2. Land animals 3. Birds 4. Aquatic animals

85. Feeling cooler after sweating is an experience of _____
1. Melting 2. Boiling 3. Sublimation 4. Evaporation

86. Tyndall effect cannot be shown by
1. Colloids 2. Suspensions 3. Emulsions 4. Solutions

87. Which of the following is an emulsion
1.Salt solution 2.Mixture of oil and water
3.Nail polish 4.Cheese

88. If the difference in boiling points of two miscible liquids is greater than 25^0C, then they are separated by _____
1.Distillation 2.Fractional distillation
3.Separating funnel 4.Evaporation

89. **Statement –I :** Air is homogeneous mixture of many gases.
Statement –II: They are separated by fractional distillation.
1.Both the statements are true
2.Statement –I is true and statement –II is false
3.Statement –I is false and statement –II is true
4.Both the statements are false

90. In automobile exhaust, the dispersion medium is _____
1. Solid 2. Liquid 3. Gas 4. Solution

91. Molar mass of 1.5055×10^{23} number of calcium atoms
1. 20gm 2. 40gm 3. 10gm 4. 30gm

92. Dalton proposed atomic theory based on
1.Law of conservation of mass 2.Law of constant proportions
3.Both A & B 4. Neither A nor B

93. Standard reference for measuring atomic masses of other elements is _____
1.Atomic mass of carbon - 12 2.Atomic mass of carbon – 14
3.Atomic mass of oxygen -16 4.Atomic mass of oxygen -18

94. Number of particles in 7.75g of phosphorous is _____
1. 6.022×10^{23} 2. 3.011×10^{23} 3. 1.5055×10^{23} 4. 6.022×10^{22}

95. Avogadro constant N_A =_____
1. 6.022×10^{20} 2. 6.022×10^{21} 3. 6.022×10^{22} 4. 6.022×10^{23}

96. Rutherford's model could not explain
1.Positivity of the atom 2.Negativity of the atom
3.Neutrality of the atom 4.Stability of the atom

97. The rules for distribution of electrons is given by _____
1. Bohr 2. Rutherford 3. Bury 4. Both A & C

98. The isotopes of Uranium is used as fuel in _____ reactors
1. Thermal 2. Hydro 3. Wind 4. Nuclear

99. **Match the following:**

a) Carbon	1) 2, 8, 8
b) Argon	2) 2, 8, 7
c) Chlorine	3) 2
d) Helium	4) 2, 4

the correct match is
1. $a \to 4, b \to 1, c \to 2, d \to 3$ 2. $a \to 3, b \to 2, c \to 1, d \to 4$
3. $a \to 2, b \to 3, c \to 4, d \to 1$ 4. $a \to 1, b \to 2, c \to 3, d \to 4$

100. Maximum number of electrons that can be accommodated in M – shell is _____
1. 2 2. 8 3. 18 4. 32

THE END