CLASS X

1) Degree of $(x-1)(x^2-2)(x^3-3).....(x^{10}-10)$ is _____

1) 10 2) 55 3)60 4) 200

2) $2x^2 + 3y^2 = 70$, $3x^2 + 2y^2 = 30$ *then* $x^4 + (2x^2 + y^2)y^2 =$ ___

1) 270 2) 800 3) 400 4) 100

3) Two numbers have LCM =50 and GCD = 5. Square of the product of numbers is

1) $5^6 \times 4$ 2) $5^6 \times 10^2$ 3) $2^3 \times 5^8$ 4) $2^6 \times 5^6$

4) $x = \sqrt{2\sqrt{2\sqrt{2\sqrt{2.....\infty}}}}$, $y = \sqrt{6\sqrt{6\sqrt{6\sqrt{6.....\infty}}}}$ *then* $\frac{x}{2} + \frac{y}{3} =$ ___

1) 1 2) 12 3) 3 4) 6

5) If a = -2023, b = 1998, c = 25 then $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} =$ ____

1) 4 2) 2023 3) 3 4) - 4046

6) Difference of mean and median for first 200 natural numbers is

1) 0 2) 100 3) 100.5 4) 50.5

7) *If* $\frac{a^n + b^n}{a^{n-1} + b^{n-1}} = \sqrt{ab}$ *then* $4n^2 - 4n + 3 =$

1) 2 2) 0 3) 3 4) -7

8) *If* $(1,3), (2,5), (4,9), (17,x)$ *are collinear then* $\frac{x-30}{2x-69} =$ ___

1) 5 2) 6 3) 0 4) 12

9) A right triangle has legs 6 and 8. The length of altitude from vertex to hypotenuse is __

1) 4 2) 4.8 3) 6.2 4) 6.6

10) $|x| + |y| = |x + y| \Rightarrow$ _____

1) xy = -8 2) xy = -1 3) xy < -8 4) xy ≥ 0

11) $x = 7 + 4\sqrt{3}$ *then* $x^2 + \frac{1}{x^2} =$ _____

1) 243 2) 194 3) 270 4) 189

12) (x + a)(x + 2) + 1 = 0 has x,a ∈ Z then sum of possible values of a = ...

1) 0 2) 2 3) 4 4) 8

13) From first 100 natural numbers one is selected at random. The chance that it is a prime number.

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

14) ABCD is any quadrilateral in the co-ordinate plane. Then the quadrilateral formed by its mid points of sides is always.

1) Trapezium 2) Square
3) Parallelogram 4) Scalene quadrilateral

15) The Probability of an event A in general should satisfy _____

1) $0 < P(A) < \frac{1}{2}$ 2) $0 \le P(A) \le 1$

3) $0 \le P(A) \le \frac{1}{4}$ 4) $-1 \le P(A) \le 1$

16) Number of solution pairs (x,y) satisfying the equation
$x^2 + y^2 + 6x + 4y + 13 = 0$ *is* ____

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

17) A pair of linear equations $a_1x + b_1y + c_1 = 0$ $a_2x + b_2y + c_2 = 0$ is said to be inconsistent, if

1) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ 2) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ 3) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ 4) $\frac{a_1}{a_2} \neq \frac{c_1}{c_2}$

18) The graph of y = 4x is a line

1) parallel to x - axis 2) parallel to y - axis
3) perpendicular to y-axis 4) passing through origin

19) Which of the following has the same mean, median and mode ?

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

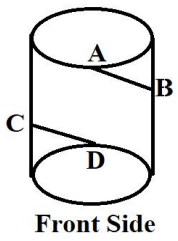
20) The probability that a leap year has 52 sundays ?

1) $\frac{3}{7}$ 2) $\frac{8}{7}$ 3) $\frac{5}{7}$ 4) None

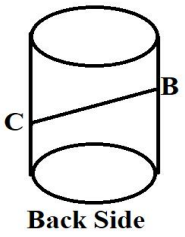
21) *If* $x^2 = 1 - y^2$ *, then average of* $y^2, x^2, x^2(3-4x^2)^2, y^2(4y^2-3)^2$ *is* ____

1) 0.8 2) 25 3) 0 4) 0.5

22) A and D are two points on rims of a cylinder as shown in the figures. AD is vertical . A string is wound round the cylinder starting at A and ending at D The string is tightly held. If diameter and height of cylinder are $\frac{12}{\pi}$ and 5 respectively then length of the string is _



Front Side



Back Side

1) 6 2) 2π 3) 13 4) π

23) *If* $x^3 + 3xy + y^3 = 1$ *then* $\max(x+y) =$ ___

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

24) $1^2 - 2^2 + 3^2 - 4^2 + 5^2 - 6^2 + \ldots\ldots\ldots\ldots + 2023^2 - 2024^2 =$

1) Divisible by 2023 2) Divisible by 2025

3) Divisible by 2024 4) Divisible by 1634

25) **T**wo sides of a triangle are 3 and 5 and third side is also an integer. Number of such triangles will be____

1) 2 2) 5 3) 11 4) 0

26) The 7th term of an AP is $\frac{-39}{12}$ and 15th term is $\frac{-103}{12}$ what is the 27th term ?

1) $\frac{-187}{12}$ 2) $\frac{-191}{12}$ 3) $\frac{-199}{12}$ 4) $\frac{-205}{12}$

27) The length of the rectangle is less than twice its breadth by 1cm. The length of its diagonal is 17cm. Its length and breadth are _____,_____.

1) 15cm, 8cm 2) 13cm, 4cm 3) 10cm, 6cm 4) 8cm, 9cm

28) *If* $A=\{1,3,4\}$ *and* $B=\{x/x\in R \text{ and } x^2-7x+12=0\}$ then which of the following is true

1) $A=B$ 2) $A\subset B$ 3) $B\subset A$ 4) A is equivalent to B

29) There are 5 green and 7 red balls.Two balls are selected one by one without replacement. The probability that first is green and second is red

1) $\frac{37}{132}$ 2) $\frac{36}{132}$ 3) $\frac{35}{132}$ 4) $\frac{132}{35}$

30) The point which lies on the perpendicular bisector of the line segment joining the points A(2,5) and B(-2,-5) is :

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

31) Who is famously known as Father of Statistics ?

1) R.A .FISHER 2) P.C.ROY 3) C.R.RAO 4) B.V.RAO

32) From first 500 natural numbers all multiples of 5 and all multiples of 6 are removed. The number of remaining numbers is__

1) 278 2) 167 3) 333 4) 222

33) The least degree of a polynomial equation with integer coefficients, two of whose roots are $1+\sqrt{2}$ *and* $2+\sqrt{3}$ is ___

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

34) Two straight lines $\frac{x}{4}+\frac{y}{3}=2$, $\frac{x}{2}+y=5$ intersect at the point (α,β) then $\left(\alpha^2+\beta^2\right)^{\frac{1}{2}}=$ __

1) 5 2) 7 3) 6 4) 12

35) Number of Circles touching all the 3 sides of the triangle formed by x=2 , y=3 and x + y = 10 is ___

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

36) A point (3,4) is reflected 2023 times about co-ordinate axes starting with y-axis, then x - axis, then y - axis etc. Continuously. Its final position is then reflected about origin and the resulting point is noted as (a,b). Now which of the following is true.

1) a + b = 0 2) a + b = 1 3) ab = 7 4) ab = 12

37) Natural numbers are divided in to groups as follows. {1}, {2,3}, {4,5,6}, {7,8,9,10} .etc.,Then first number in 101th group will be _____

1) 7875 2) 5661 3) 5051 4)3750

38) Which of the following point lies necessairly with in the triangle?

1) Centroid 2) Ortho center 3) Circum center 4) all above

39) A triangle has vertices (0,0) , (4,0) and (0,3). Then length of its longest median is _____

1) $\frac{\sqrt{73}}{2}$ 2) $\sqrt{13}$ 3) $\sqrt{5}$ 4)$\sqrt{103}$

40) Which of the following equations represent a parabola in graph $y = ax^2 + bx + c$ when : _____

1) $a \neq 0$,b,c $\in$ R 2) a = 0, b $\neq$ c $\in$ R 3) a=0, b=c $\neq 0 \in$ R 4)$\forall$ a,b,c $\in$ R

41) Which of the following is a non leap year?

1) 2022 2) 2024 3) 2076 4) 2032

42) The difference of areas of incircle and circumcircle of a square whose diagonal is $\sqrt{8}$ is ___

1) π 2) 2π 3) $\pi\sqrt{3}$ 4) None

43) $x^3 + ax^2 + bx + c$ is completly divisible by 1+ x , 2 + x and 3 + x then b - 2c =..

1) 0 2) 6 3) -1 4) -6

44) For the given data $\frac{3\ Median - Mode}{Mean}$ = ____

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

45) (x - 3) (x - 5) (x - 7) - 1 = 0 has roots α , β , γ . *Then* $\alpha^{-1} + \beta^{-1} + \gamma^{-1}$ = ____

1) $\frac{-71}{106}$ 2) $\frac{21}{53}$ 3) $\frac{72}{113}$ 4) 1

46) The father age is six times his son's age. After Four years the age of the father will be four times his son's age. The present ages of the son and father are respectively

1) 4 & 24 2) 5 & 30 3) 6 & 36 4) 3 & 24

47) The mean of four numbers is 37. The mean of the smallest three of them is 34. if the range of the data is 15, what is the mean of the largest three?

1) 41 2) 38 3) 40 4) 39

48) The centre of the circle passing through the points (6,-6), (3,-7) and (3,3)

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

49) Three consecutive vertices of a parallelogram are (1, -2) (3, 6) and (5, 10). The coordinates of the fourth vertex are :

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

50) Who gave the formulae for finding the sum of first 100 natural numbers?

1) BHASKARA 2) C.F.GAUSS

3) BRAHMA GUPTA 4) EUCLID

51) In a college 20 professors teach mathematics or physics. If 12 teach maths and 4 teach both physics and maths, how many teach only physics

1) 10 2) 8 3) 12 4) 15

52) The lengths of the diagonals of a rhombus are 16 cm and 12 cm. Then, the length of the side of the rhombus is :

1) 9cm 2) 10cm 3) 8cm 4) 20cm

53) If A = { 3,5,7,9,10} , B = {7,9,10,13}, C = {10,13,15}. Then $(A \cap B) \cap (B \cup C)$ = ..

1){7,9,10} 2){3,5,7} 3) {9,10,13} 4)None

54) A(5, 1) B(1, 5) and C(-3, -1) are the vertices of $\triangle ABC$. the length of its median AD is

1) $\sqrt{34}$ 2) $\sqrt{35}$ 3) $\sqrt{37}$ 4) 6

55) Sum of radii of two concentric circles is 14 and their difference is 2. The area of their annulus is _____(nearly).

1) 88 2) 68 3) 35 4) 22

56) A set of 3 parallel lines are cut by another set of 4 parallel lines. The number of quadrilaterals of the network is ___

1) 16 2) 18 3) 28 4) 12

57) A number looks like this 122333444455555.....What is the 200th digit of this number_____

1) 2 2) 0 3) 20 4)1

58) Missing term of series $\frac{1}{503}, \frac{1}{131}, \frac{9}{581}, \frac{16}{692}, \_\_\_\_, \frac{9}{287}$ is $\frac{a}{b}$ then 40a - b =_

where a and b are relatively prime numbers.

1) 3 2) 5 3) 8 4) 24

59) The incentre of triangle with vertices $(0,0)$, $(2,0)$, $(1,\sqrt{3})$ has sum of squares of coordinates.

1) 2/13 2) 1 3) 4/3 4) 2/3

60) The greatest Indian Mathematician who received prize equal to Nobel Prize in the field of Statistics in 2023.

1) P.C.Mahalanobis 2) R.C.Guptha

3) C. R . RAO 4) P.C.ROY