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INTERNATIONAL CYBER OLYMPIAD	NATIONAL INTERACTIVE SCIENCE OLYMPIAD	NATIONAL INTERACTIVE MATHS OLYMPIAD	NATIONAL BIOTECHNOLOGY OLYMPIAD	INTERNATIONAL ENGLISH OLYMPIAD	INTERNATIONAL G.K. OLYMPIAD

Level - 1 : Level-1 winners will get certificate, apititude report, medals for the school toppers and online subscription.

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Level - 3 : Top 1% will qualify for level 3-International level-where you will compete with students globally. Get selected for EHFs International Olympiad training camp. Only Indian organization giving students exposure to global competitions. Represent India & win laurels. Guidance by top scientists.
Prizes ranges from cash (millions of $), gadgets, foreign trips, publicity, fame, scholarships, Internships, conference participation and more.

NATIONAL INTERACTIVE MATHS OLYMPIAD

NIMO

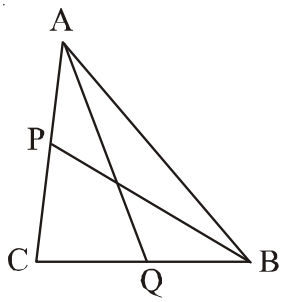
11 Class **A1 Paper Code**

L E V E L - 1

1. You are allowed additional 10 minutes to fill the required details in the **RESPONSE SHEET.**
2. The question paper is made as per syllabus guidelines & pattern given in the information Booklet. The Question Paper for Classes 1 to 6 contains 25 Questions each to be answered in 40 minutes. The Question paper for classes 7 to 12 contains 50 Questions each to be answered in 60 minutes. All questions are compulsory. Further instructions are given in the instruction letter to the coordinator teacher.
3. Use the response sheet to mark your responses by darkening the required circle. The response sheet has to be returned to the foundation, duly filled in. The student can retain the Question Paper.

MENTAL ABILITY

1. In the figure P & Q are mid points of AC & BC. Then $5AB^2$ is



(1) $4(AQ^2 + BP^2)$ (2) $4(AC^2 + BC^2)$

(3) $AP^2 + BQ^2$ (4) None of these

2. Choose one number which is similar to the numbers in the given set.

363, 489, 579

(1) 562 (2) 382

(3) 471 (4) None of these

3. Choose the correct alternative for question mark : -

28	4	7
84	7	12
45	?	9

(1) 6 (2) 5

(3) 7 (4) None of these

4. Choose the correct alternative.

____ ____ aba ____ ____ ba ____ ab

(1) abbba (2) abbab

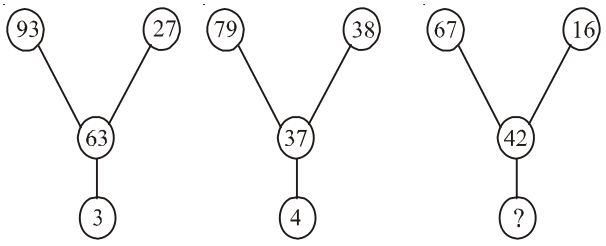
(3) baabb (4) None of these

5. Write the missing term 95, 115.5, 138, ____ , 189

(1) 154.5 (2) 162.5

(3) 164.5 (4) None of these

6. Choose the correct alternative for question mark : -



(1) 9 (2) 6

(3) 5 (4) None of these

7. Rohit walked 25 metres towards South. Then he turned to his left and walked 20 metres. He then turned to his left and walked 25 metres. He again turned to his right and walked 15 metres. At what distance is he from the starting point and in which direction ?

(1) 35 metres East (2) 35 metres North

(3) 60 metres East (4) None of these

8. Given set : - (246, 257, 358). Choose the similar set?

(1) (145, 235, 325) (2) (143, 253, 246)

(3) (273, 365, 367) (4) None of these

9. Pipe A can fill a tank in 20 hours while Pipe B alone can fill it in 30 hours and Pipe C can empty the full tank in 40 hours. If all the pipes are opened together, how much time will be needed to make the tank full ?

(1) $17\frac{1}{7}$ hours (2) $17\frac{7}{1}$ hours

(3) 7 hours (4) None of these

10. A man swims downstream 30 km and upstream 18 km taking 3 hrs each time. What is the velocity of current?

(1) 3 km/hr (2) 6 km/hr

(3) 2 km/hr (4) None of these

MATHEMATICS

11. The total surface area of a right circular cone of slant height 13 cm is $90\pi\,cm^2$. Calculate its radius in cm.

(1) 5 cm (2) 4 cm

(3) 17 (4) None of these

12. Which one is correct ?

(1) $\sin^2\theta + \cos^2\theta = 1$ (2) $1+\tan^2\theta = \text{cosec}^2\theta$

(3) $1+\cot^2\theta = \sec^2\theta$ (4) None of these

13. Evaluate sec 40° sin 50° + cos 50° cosec 40°

(1) 1 (2) 3

(3) 2 (4) None of these

14. What number must be added to each of the numbers 6,15, 20 and 43 to make them proportional ?

(1) 1 (2) 3

(3) 4 (4) None of these

15. Evaluate (without using trigonometric tables)

$$\frac{\text{Sin } 23^\circ}{\text{Cos } 67^\circ}$$

(1) 2 (2) 0

(3) 1 (4) None of these

16. A two-digit number is such that the product of its digits is 8. When 18 is subtracted from the number, the digits interchange their place. Find the number.

(1) 42 (2) 43

(3) 32 (4) None of these

17. If $\frac{5a+3b}{4a+5b}=\frac{2}{3}$, find the ratio of a : b.

(1) 6 : 1 (2) 1 : 7

(3) 2 : 1 (4) None of these

18. Find the nature of the roots of the equation.

$3x^2 - 4x + 5 = 0$

(1) Rational and unequal (2) Irrational and equal

(3) Imaginary (4) None of these

19. If A = { x : x is a multiple of 4} and B = { x : x is a multiple of 6}, then $A \cap B$ consists of all multiples of

(1) 16 (2) 12

(3) 8 (4) None of these

20. A function f is defined by f $(x) = x^2 + 3$, $X \in N$ and $x \le 5$; find the range of f(x).

(1) {4, 7, 19, 28} (2) {4, 7, 12, 13, 24}

(3) {4, 7, 12, 19, 28} (4) None of these

21. Number of revolutions made by a circular wheel = ?

(1) $\frac{\text{Total distance described}}{\text{Circumference of the wheel}}$

(2) $\frac{\text{Total distance described}}{\text{Area of the wheel}}$

(3) $\frac{\text{Circumference}}{\text{Diameter}}$

(4) None of these

22. The opposite angles of a cyclic quadrilateral are

(1) Complementary (2) Supplementary

(3) 360° (4) None of these

23. Find the equation of the line passing through (3, 7) whose slope is $\frac{-3}{2}$.

(1) $3x + 2y = 23$ (2) $3x + 3y = 24$

(3) $3x + 4y = 23$ (4) None of these

24. The coefficient of x^4 in $\left(\frac{x}{2} - \frac{3}{x^2}\right)^{10}$ is

(1) $\frac{405}{256}$ (2) $\frac{504}{259}$

(3) $\frac{450}{263}$ (4) None of these

25. Two lines with slopes m_1 and m_2 are parallel to each other if

(1) $m_1 = m_2$ (2) $m_1 m_2 = -1$

(3) $\frac{m_1}{m_2} = 1$ (4) None of these

26. Rita deposits ₹600 p.m. in a bank paying 12% p.a on recurring deposits. Find the amount due to her after 3 years, if the interest is simple interest paid by bank on the recurring deposit.

(1) ₹19,197 (2) ₹25,596

(3) ₹ 26,696 (4) None of these

27. Find the slope of a line whose inclination with the x - axis is 150°.

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

(3) $\frac{-1}{\sqrt{3}}$ (4) None of these

28. Everybody shakes hands with everybody else. If total number of hands shaken were 66, then how many persons were present?

(1) 11 (2) 12

(3) 13 (4) None of these

29. Compute $\sqrt{-169}$

(1) 13i (2) 169i

(3) 12i (4) None of these

30. How many triangles can be formed by joining the vertices of a hexagon ?

(1) 19 (2) 21

(3) 20 (4) None of these

31. Formula for finding the sum of given number of terms of an A.P. (Arithmetic Progression) is

(1) $Sn = \frac{n}{2}[2a + (n-1)d]$ (2) $Sn = [2a + (n-1)d]$

(3) $Sn = \frac{n(n-1)d}{2}$ (4) None of these

32. Simplify : $\frac{3}{(x-1)} - \frac{2}{x} + \frac{(x+3)}{(x+1)(x-1)}$

(1) $\frac{2x^2 + 6x + 2}{x^3 - x}$ (2) $\frac{2x^2 + 6x + 2}{x - 1}$

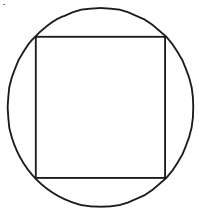
(3) $\frac{2x^2 + 6x}{x - 1}$ (4) None of these

33. One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting a king of red suit.

(1) $\frac{1}{26}$ (2) $\frac{1}{27}$

(3) $\frac{1}{24}$ (4) None of these

34. The area of a circle is 154 sq.m. Find the length of the side of the inscribed square.



(1) 7m (2) $8\sqrt{2}$ m

(3) $7\sqrt{2}$ m (4) None of these

35. If θ is an acute angle and $\tan\theta$ = 8/15, find the value of $\sin\theta$.

(1) $\frac{17}{8}$ (2) $\frac{8}{17}$

(3) $\frac{17}{15}$ (4) None of these

36. Find the radian measures corresponding to the 340° measure :

(1) $\frac{17\pi}{9}$ (2) $\frac{9\pi}{17}$

(3) 9π (4) None of these

37. In a simultaneous toss of two coins, find the probability of getting 2 heads.

(1) 1/2 (2) 1/4

(3) 1/3 (4) None of these

38. Check whether the equation $x + \frac{1}{x} = x^2 \ (x \neq 0)$ is quadratic.

(1) Yes (2) No

(3) Can't say (4) None of these

39. Which ratio is greater 13 : 21 or 19 : 28 ?

(1) $\frac{13}{21}$ (2) $\frac{19}{28}$

(3) Both (1) and (2) are equal (4) None of these

40. If (3, 3), (h, 0), (0, k) are collinear then $\frac{1}{h} + \frac{1}{k} =$

(1) $\frac{-1}{3}$ (2) 3

(3) $\frac{1}{3}$ (4) None of these

EtG INTERACTIVE SECTION

41. If twice the area of a smaller square is substracted from the area of a larger square, the result is 14 cm^2. How ever if twice the area of the larger square is added to three times the area of the smaller square, the result is 203 cm^2. Determine the sides of the two squares.

(1) 7 cm, 4 cm (2) 6 cm, 3 cm

(3) 8 cm, 5 cm (4) None of these

42. Two AP's have the same common difference. The first term one of these is 3 and that of the other is 8. What is the difference between their 10th terms?

(1) 5 (2) 10

(3) 15 (4) None of these

43. If $\tan 2\theta = \cot(\theta + 6^\circ)$, where 2θ and $\theta + 6^\circ$ are acute angles, find the value of θ.

(1) 26° (2) 27°

(3) 28° (4) None of these

44. If base of a right angled triangle is twice the base of another right angled triangle and height of first right angled triangle is 1/4 th of other's height, then what will be the ratio of areas of the first triangle to the second triangle?

(1) 1 : 2 (2) 1 : 3

(3) 2 : 3 (4) None of these

45. What is the degree of the differential equation

$$x = 1 + xy\left(\frac{dy}{dx}\right) + \frac{x^2y^2}{2}\left(\frac{dy}{dx}\right)^2 + \frac{x^3y^3}{6}\left(\frac{dy}{dx}\right)^3 + ...?$$

(1) 1 (2) 2

(3) 3 (4) None of these

46. A square park has each side 100 m. At each corner of the park, there is a flower bed in the form of a quadrant of radius 14 m. The area of the remaining part of the park is

(1) 9380 m^2 (2) 9345 m^2

(3) 9384 m^2 (4) None of these

47. At the end of the year 2002, Ram was half old as his grandpa.The sum of the years in which they were born is 3854. What will be the age of Ram at the end of year 2003?

(1) 51 (2) 50

(3) 36 (4) None of these

48. What is the number of ordered pairs (x, y) satisfying

$|y| = \cos x$ and $|y| = \sin^{-1}(\sin x)$ where $|x| \leq 3\pi$?

(1) 2 (2) 4

(3) 6 (4) None of these

49. The denominator of a rational number is greater than its numerator by 3. If 3 is substracted from the numerator and 2 is added to the denominator, the new number becomes $\frac{1}{5}$. What was the original number?

(1) $\frac{5}{8}$ (2) $\frac{3}{5}$

(3) $\frac{7}{11}$ (4) None of these

50. What will be the coordinate of the third vertex of an equilateral triangle whose two vertices are at (3, 4) and (– 2, 3) ?

(1) (7, 1)

(2) $\left(\frac{1+\sqrt{3}}{2}, \frac{7-5\sqrt{3}}{2}\right)$ or $\left(\frac{1-\sqrt{3}}{2}, \frac{7+5\sqrt{3}}{2}\right)$

(3) (1, 5) (4) None of these

END OF THE EXAM