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INTERNATIONAL CYBER OLYMPIAD	NATIONAL INTERACTIVE SCIENCE OLYMPIAD	NATIONAL INTERACTIVE MATH OLYMPIAD	NATIONAL BIOTECHNOLOGY OLYMPIAD	INTERNATIONAL ENGLISH OLYMPIAD	INTERNATIONAL G.K. OLYMPIAD	BSE INTERNATIONAL FINANCE OLYMPIAD	NATIONAL IIT-PMT OLYMPIAD

Level - 1 : All Level-1 successful* participants will get certificate, apititude report and online subscription, and school toppers will be eligible for school hero medals.

Level - 2 : School toppers* will be selected for level-2-National level - online computer based interactive test held at exam centres all over India. Besides selection for level-3, winner will get merit certificate, medals, educational CDs, laptop, scholarship and other prizes. There is no level 2 in Art, Cricket, Cyber, NIPO and Biotech.

Level - 3 : Toppers 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.

* # See prospectus/website for details

EHF

NATIONAL INTERACTIVE MATHS OLYMPIAD

NIMO

10 Class

B1 Paper Code

LEVEL-1

1. **You are allowed additional 10 minutes to fill the required details in the RESPONSE SHEET (OMR).**
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 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. How many months are equal to 45 days?

(1) $1\frac{1}{2}$ months (2) $1\frac{1}{4}$ months

(3) $2\frac{1}{4}$ months (4) None of these

2. In series 1,3,7,15, ..., what is the next term?

(1) 29 (2) 30

(3) 31 (4) None of these

3. What is the area of an equilateral triangle if the length of side is a unit?

(1) $\frac{\sqrt{3}}{4}a^2$ (2) $\frac{\sqrt{3}}{2}a^2$

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

4. Name the mathematician who first computed the decimal expansion of π(pie).

(1) Pythagoras (2) Archimedes

(3) Euclid (4) None of these

5. In the group of 26 girls Amita's position is 7th from the bottom. What is the position of Amita from the top of the group?

(1) 20^{th} (2) 21^{st}

(3) 22^{nd} (4) None of these

6. The mean of 10 numbers is 20. If 5 is subtracted from every number, what will be the new mean?

(1) 15 (2) 20

(3) 25 (4) None of these

7. One half of the difference between the number of degrees in a rectangle and the number of degrees in a triangle is

(1) 360° (2) 180°

(3) 90° (4) None of these

8. Mahesh walks 20 m North then he returns right and walks 30 m. Now he turns right and walks 35 m. After turning left, he walks 15m. Again he turns left and moves 15m. In which direction and how far is he from his original position?

(1) 15 m East (2) 45 m East

(3) 45 m West (4) None of these

9. A student was asked to multiply a given number by $\frac{4}{5}$. By mistake he divided it by $\frac{4}{5}$. His answer was 36 more than the correct answer. Find the given number.

(1) 80 (2) 60

(3) 36 (4) None of these

10. If '100' interchange '1000', '–' interchange '+', '×' interchange '+', then

$100 - 10 \times 1000 \div 1000 \times 100 \times 10 = ?$

(1) 1110 (2) 1000

(3) 0 (4) None of these

MATHEMATICS

11. If p, q are two consecutive natural numbers, then HCF (p, q) is:

(1) p (2) q

(3) 1 (4) none of these

12. Which of the following numbers has terminating decimal expansion?

(1) $\frac{37}{45}$

(2) $\frac{21}{(2^3 5^6)}$

(3) $\frac{89}{(2^2 3^2)}$

(4) None of these

13. If the distance between the points (p, –5) and (2, 7) is 13 units, then the value of 'p' is

(1) –3, –7

(2) –3, 7

(3) 3, –7

(4) None of these

14. Find a quadratic polynomial, the sum and product of whose zeroes are –7 and –2.

(1) $x^2 - 7x - 2$ (2) $x^2 - 7x + 2$

(3) $x^2 + 7x - 2$ (4) None of these

15. Find the remainder when $y^3 + 4y^2 - 3y + 10$ is divided by $y + 4$.

(1) 22

(2) –22

(3) 21

(4) None of these

16. The father's age is six times his son's age. Four year hence, the age of the father will be four times his son's age. The present ages in years, of the son and the father are, respectively.

(1) 4 and 24

(2) 5 and 30

(3) 6 and 36

(4) None of these

17. If $a679b$ is a five digit number of base 10 and is divisible by 72, then the values of a and b are

(1) 3, 2

(2) 6, 2

(3) 2, 3

(4) None of these

18. Which term of the A.P. 24, 21, 18,…… is the first negative term ?

(1) 8^{th}

(2) 9^{th}

(3) 10^{th}

(4) None of these

19. If $a + 1$, $2a + 1$, $4a - 1$ are in A.P., then the value of a is:

(1) 1 (2) 2

(3) 3 (4) None of these

20. The pair of equations $x = a$ and $y = b$ graphically represents lines which are

(1) Parallel

(2) intersecting at (b, a)

(3) intersecting at (a, b)

(4) None of these

21. The system of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ has a unique solution if

(1) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

(2) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

(3) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

(4) None of these

22. Find the distance between the points (3, –2) and (6, 4).

(1) $3\sqrt{5}$

(2) $5\sqrt{3}$

(3) $\sqrt{85}$

(4) None of these

23. If the orthocentre and centroid of a triangle are (–3, 5) and (3, 3) respectively, then the circumcentre is

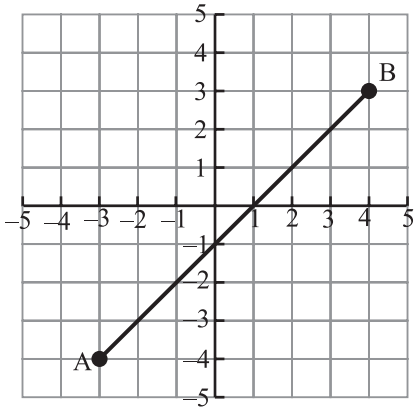
(1) (6, 2)

(2) (0, 8)

(3) (6, –2)

(4) None of these

24. Find AB.



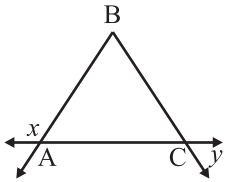
(1) $\sqrt{2}$ (2) $2\sqrt{7}$

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

25. In the accompanying diagram,

$\overline{BA} \cong \overline{BC}$ and $m\angle x = 117$.

Find $m\angle y$.



(1) 117

(2) 110

(3) 63

(4) None of these

26. The legs of a right triangle measure 8 and 15. If a leg and hypotenuse of another right triangle are 8 and 17 respectively, these two right triangles are congruent.

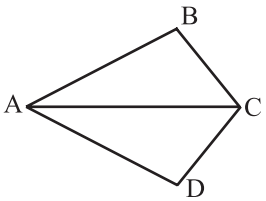
(1) True

(2) False

(3) Can't say

(4) None of these

27. Given: $\overline{AC}$ bisects $\angle BAD$ and $\angle BCD$. Which of the following methods can be used to prove $\Delta ABC \cong \Delta ADC$?



(1) Side – Angle – Side (SAS)

(2) Angle – Side – Angle (ASA)

(3) Angle – Angle – Side (AAS)

(4) None of these

28. A line touches a circle of radius 4 cm. Another line is drawn which is tangent to the circle. If the two lines are parallel then distance between them is

(1) 6 cm

(2) 7 cm

(3) 8 cm

(4) None of these

29. A quadrilateral ABCD is drawn to circumscribe a circle. If AB = 12 cm, BC = 15 cm and CD = 14 cm, then AD is equal to

(1) 10 cm

(2) 11 cm

(3) 12 cm

(4) None of these

30. Let m be the mid point and l be the upper class limit of a class in a continous frequency distribution. The lower class limit of the class is:

(1) $2m + l$

(2) $2m - l$

(3) $m - l$

(4) None of these

31. If each observation of the data is increased by 5, then their mean

(1) remains the same

(2) is decreased by 5

(3) is increased by 5

(4) none of these

32. A dice is thrown once, the probability of getting a number lying between 2 and 6.

(1) $\frac{1}{6}$

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

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

(4) None of these

33. There are 27 roses in a flower vase. Each rose is distinctly red or white in colour. A rose is picked at random from the vase. It is observed that the probability of picking a white rose is $\frac{5}{9}$. How many red roses does the flower vase contain?

(1) 7

(2) 8

(3) 12

(4) None of these

34. If $\cos A = \frac{4}{5}$, then the value of tan A is

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

(2) $\frac{3}{4}$

(3) $\frac{4}{3}$

(4) None of these

35. The value of tan 10° tan 15° tan 75° tan 80° is

(1) –2

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

(3) 1

(4) None of these

36. $9 \tan^2 \theta - 9 \sec^2 \theta =$

(1) 1

(2) 9

(3) –9

(4) None of these

37. If 5 poles are erected at equal distances between two points 20 metres apart, what is the distance between any two poles?

(1) 3 metres

(2) 4 metres

(3) 5 metres

(4) None of these

38. Kavita has one-quarter more money than Nitin, Nitin has two-third money as of Praveen. If Praveen has ₹ 876 with him, how much money Kavita has?

(1) ₹ 730

(2) ₹ 365

(3) ₹ 467.20

(4) None of these

39. The charges of hired car are ₹ 4 per km for the first 60 km, ₹ 5 km for the next 60 km and ₹ 8 for every 5 km for the further journey. If the balance amount left over with Ajit is $\frac{1}{4}$ less than what he paid towards the charges of the hired car for travelling 320 km, how much money did he have initially with him?

(1) ₹ 1032

(2) ₹ 1253

(3) ₹ 1548

(4) None of these

40. A train X starts from Meerut at 4 p.m. and reaches Ghaziabad at 5 p.m., while another train Y starts from Ghaziabad at 4 p.m. and reaches Meerut at 5:30 p.m. The two trains will cross each other at

(1) 4:36 p.m.

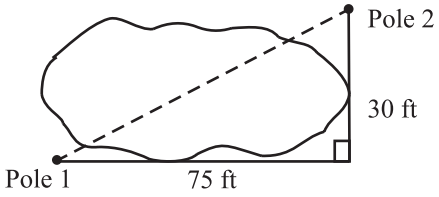
(2) 4:42 p.m.

(3) 4:48 p.m.

(4) None of these

INTERACTIVE SECTION

41. A communication company must run a telephone line between two poles at opposite ends of a lake, as shown in the accompanying diagram. The length and width of the lake are 75 feet and 30 feet, respectively. What is the distance between the two poles, to the nearest foot?



(1) 105

(2) 81

(3) 69

(4) None of these

42. The hourly wages of a sample of 130 system analysts are given below.

Mean = 60 Range = 20

Mode = 73 Variance = 324

Median = 74

The coefficient of variation equals:

(1) 0.30 %

(2) 30 %

(3) 5.4 %

(4) None of these

43. The case contains red and green tiles, the ratio of red tiles to green tiles, then how many red tiles are there?

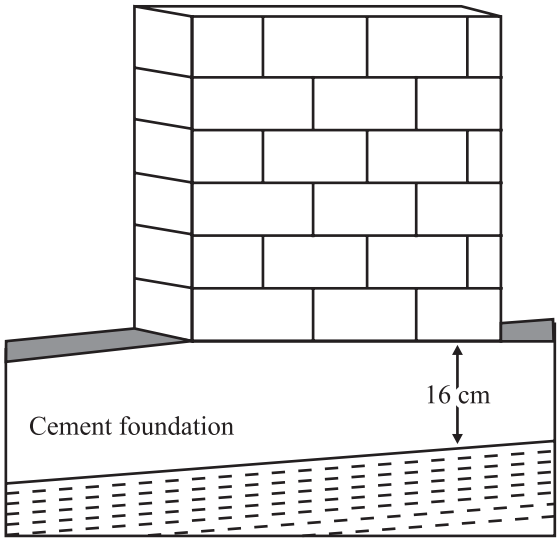
(1) 60

(2) 80

(3) 70

(4) None of these

44. Imagine a cement foundation that is 16 cm above the level of the ground. On this foundation, you build up 6 layers of stone blocks. Each layer is 8 cm thick. As you add each layer of blocks the height of the pile becomes larger. What would be the form of equation if x represents the number of layers and y represents the height of the pile?



(1) $y = 8x + 16$

(2) $x = 8y + 16$

(3) $x + y = 16$

(4) None of these

45. This is the most famous theorem of triangles, which states that in a right angled triangle, the square of the hypotenuse is equal to the sum of the squares of lengths of the other two sides. Name the theorem.

(1) Triangle proportionality theorem

(2) Pythagoras theorem

(3) Mid point theorem

(4) None of these

46. What is the base of the binary number system?

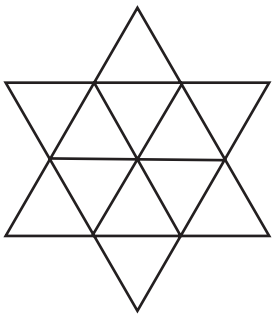
(1) 0

(2) 1

(3) 2

(4) None of these

47. Count the number of triangles in the following figure.



(1) 13

(2) 20

(3) 25

(4) None of these

48. What is the biggest number that can be represented by two digits?

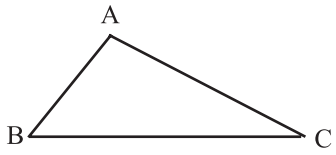
(1) 9^9

(2) 99

(3) Can't say

(4) None of these

49. Three villages A, B and C form a scalene triangle on flat land. A well needs to be constructed on the same flat land in such a way that it is equidistant from the three villages.



The well should be built at

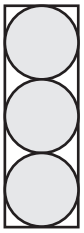
(1) the incentre of ΔABC.

(2) the centroid of ΔABC.

(3) the circumcentre of ΔABC.

(4) None of these

50. A cylindrical tennis ball container contains three balls stacked on one another, such that they touch the wall of the container. The top and bottom balls also touch the lid and the base of the container respectively.



If the volume of a tennis ball is 160 cm^3, then what is the volume of the container?

(1) 720 cm^3

(2) 840 cm^3

(3) 1440 cm^3

(4) None of these

END OF THE EXAM