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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, G.K. 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. Level 3 is in Maths, Science & Cyber only.

* # See prospectus/website for details

EHF NATIONAL INTERACTIVE MATHS OLYMPIAD

N I M O

9 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 (OMR). STUDENTS OF CLASS 1 & 2 HAVE TO UNDERLINE** THE CORRECT ANSWER IN THE QUESTION PAPER ITSELF. THEY ARE NOT REQUIRED TO USE THE RESPONSE SHEET (OMR). THEY HAVE TO FILL THEIR NAME, ROLL NUMBER, CLASS, SCHOOL NAME IN THE SPACE PROVIDED IN THE QUESTION PAPER.
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 EXCEPT FOR CLASSES 1 AND 2.

MENTAL ABILITY

1. 1, 3, 8, 19, 42, ?, 184
(1) 3 (2) 6
(3) 88 (4) None of these

2. What is the value of $\dfrac{1\frac{1}{2}}{1-\frac{1}{1-\frac{1}{4}}}$?
(1) 1 (2) 3/2
(3) 5/6 (4) None of these

3. The difference of the squares of two consecutive integers is equal to:
(1) Sum of both numbers
(2) An even number
(3) Product of both numbers
(4) None of these

4. In a certain language, if 1 is coded as A, 2 as B, 3 as C, and so on, how is FLOWER coded in that language?
(1) 6121523518 (2) 6121823515
(3) 6211523518 (4) None of these

5. If x stands for 'addition'; < for 'subtraction', + stands for 'division', > for 'multiplication', - stands for 'equal to', ÷ for 'greater than' and = stands for ' less than', state which of the following is true ?
(1) $3 \times 2 < 4 \div 16 < 2 + 4$ (2) $2 > 2 + 2 = 10 < 4 \div 2$
(3) $3 \times 4 > 2 - 9 + 3 < 3$ (4) None of these

6. Ravi travelled 4 km straight towards south. He turned left and travelled 6 km straight, then turned right and travelled 4 km straight. How far is he from the starting point ?
(1) 8 km (2) 10 km
(3) 12 km (4) None of these

7. Price of a commodity is reduced by 10%, to bring it to the original price, what should be the increase in the new price?
(1) 10% (2) $9\frac{1}{11}\%$
(3) $11\frac{1}{9}\%$ (4) None of these

8. Pointing towards a man in the photograph, lady said "the father of his brother is the only son of my mother". How is the man related to the lady ?
(1) Bother (2) Son
(3) Nephew (4) None of these

9. India Gate : Delhi :: _____:_____
(1) Chicago : USA (2) Albany : New York
(3) Agra : Taj Mahal (4) None of these

10. PUNJAB : AMRITSAR :: _____:_____
(1) Golden Temple : Amritsar
(2) Moscow : Russia
(3) Agra : Taj Mahal
(4) None of these

MATHEMATICS

11. Between any 2 rational number there lies:
(1) Two rational numbers
(2) No rational number
(3) Infinite rational numbers
(4) None of these

12. The additive inverse of $\frac{a}{b}$ is
(1) $\frac{b}{a}$ (2) $\frac{b^2}{a^2}$
(3) $\frac{a}{b}$ (4) None of these

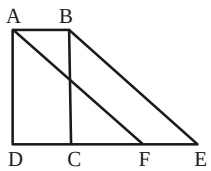
13. Addition is associative for :
(1) Natural numbers (2) Whole numbers
(3) Rational numbers (4) All of these

14. Sum of two numbers is 95. If one exceeds the other by 15 find the numbers.
(1) 40 and 55 (2) 45 and 50
(3) 45 and 55 (4) None of these

15. Two numbers are in the ratio 5:3. If they differ by 18, what are the numbers?
(1) 27 and 35 (2) 45 and 27
(3) 43 and 26 (4) None of these

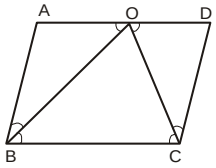
16. Three consecutive integers add upto 51. What are these numbers?
(1) 15, 16, 17 (2) 14, 15, 16
(3) 16, 17, 18 (4) None of these

17. Given AB = 5 cm and AD = 9 cm in the below figure. Find the area of parallelogram ABEF



(1) 43 cm^2 (2) 42 cm^2
(3) 45 cm^2 (4) None of these

18. In parallelogram ABCD shown in the figure, BO bisects ∠ABC and CO bisects ∠BCD. Find the magnitude of ∠COB



(1) 45°
(2) 90°
(3) 80°
(4) None of these

19. Find the sum of interior angles of a polygon with 14 sides.
(1) 2006° (2) 2060°
(3) 2160° (4) None of these

20. Which least number should be subtracted from 629 so as to get a perfect square?
(1) 4 (2) 5
(3) 6 (4) None of these

21. In a right angled triangle ABC, right angled at B, AB = 6cm, BC = 8cm then AC = ____
(1) 10 (2) 12
(3) 21 (4) None of these

22. What is the length of the side of a square whose area is 441 cm^2 ?
(1) 21 (2) 22
(3) 20 (4) None of these

23. Which of the following is a correct statement?
(1) Cube of a negative number is always positive.
(2) Cube of a negative number is also a negative number.
(3) Cube of a positive number is always positive.
(4) Both (2) and (3)

24. Cube of 216 is
(1) 10077696 (2) $(216)^3$
(3) Both (1) and (2) (4) None of these

25. The volume of a cube is 64088 cubic units. The length of its side is
(1) $2^3 \times 5^3 \times 9^3$ (2) $2^3 \times 7^3 \times 3^3$
(3) $2^3 \times 7^3 \times 13^3$ (4) None of these

26. What is the gain percent if 25 mangoes bought at `4.50 each, are sold for `132.75?
(1) 18% (2) 13%
(3) 22% (4) None of these

27. The price at which a flower girl had bought a dozen of flowers is the same as the price at which she is selling 8 flowers. What is her profit percentage?
(1) 40% (2) 35%
(3) 50% (4) None of these

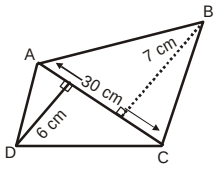
28. A shopkeeper offers 15% discount to his customer, and even after that he earns a profit of 19%. By how much percentage has the shopkeeper marked his cost price?
(1) 40% (2) 25%
(3) 32% (4) None of these

29. Evaluate $(2x + 5y - z)^2$
(1) $7x^2 + 25y^2 - z^2 + 6xy - 2yz - 7xz$
(2) $2(2x^2 - 2xz - 5yz + 10xy) + z^2 + 25y^2$
(3) $(2x^2 - 2xz - 5yz + 10xy) + z^2 + 25y^2$
(4) None of these

30. What is the simplified form of the expression
$(x + y + 6)(x - y + 2)$
(1) $x^2 + y^2 + 2x - 2y + 12$
(2) $x^2 - y^2 + 8x - 4y + 12$
(3) $x^2 - y^2 + 8x - 4y + 8$
(4) None of these

31. Evaluate the given expression : $(a + b)^2 - (a - b)^2$
(1) 4ab (2) $2(a^2 + b^2)$
(3) $2(a^2 + b^2 - 2ab)$ (4) None of these

32. What is the area of the given quadrilateral ABCD?



(1) $110\ cm^2$ (2) $195\ cm^2$
(3) $320\ cm^2$ (4) None of these

33. The total cost of 3 identical bottles and 2 identical jugs is `350. If the cost of a bottle is `x and the cost of a jug is `y, then which equation is consistent with the given information?
(1) $3x + 2y = 350$ (2) $2x + 3y = 350$
(3) $\frac{x}{2} \quad \frac{y}{3} = 350$ (4) None of these

34. If $\Delta ABC \cong DEF$ by SSS congruence rule then;
(1) AB = EF, BC = FD, CA = DE
(2) AB = FD, BC = DE, CA = EF
(3) AB = DE, BC = EF, CA = FD
(4) None of these

35. In a right angled triangle, if one acute angle is half the other, then the smallest angle is:
(1) 15º (2) 30º
(3) 45º (4) None of these

36. Name the axis on which the point (0, 9) lie.
(1) x–axis (2) y–axis
(3) Both (1) and (2) (4) None of these

37. Name the axis on which the point (7, 0) lie.
(1) x–axis (2) y–axis
(3) Both (1) and (2) (4) None of these

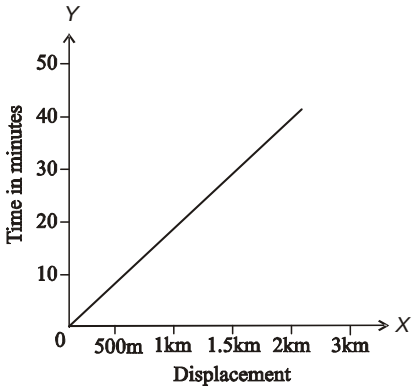
38. Name the figure obtained by joining the points (0, 0), (5, 3) and (0, 3) in the carteian plane.
(1) Square (2) Rectangle
(3) Trapezoid (4) None of these

39. Any outcome of an experiment is known as _____.
(1) Trial (2) Random experiment
(3) Experiment (4) None of these

40. If $E_1, E_2, E_3, \ldots\ldots, E_n$ are n elementary events associated to a random experiment, then:
$P(E_1) + P(E_2) + P(E_3) + \ldots\ldots + P(E_n) = ?$
(1) 2 (2) Infinity
(3) 1 (4) None of these

INTERACTIVE SECTION

41. The displacement time graph of a car is given below



What can you say about the velocity of the car, by using the above graph?

$$vector \quad \frac{displacement\ covered}{time\ taken}$$

(1) Velocity is constant.
(2) Velocity is zero.
(3) Velocity of the car increases continuously.
(4) None of these

42. The following table shows the monthly wages of 50 workers of a factory:

Wages (in`)	600-649	650-699	700-749	750-799
No.of workers	12	21	14	3

How many workers earn more than `649?
(1) 17 (2) 38
(3) 50 (4) None of these

43. On the basis of the given data, answer the following question. The given table shows the frequency distribution of the number of letters posted in a post-box during June2003.

No. of letters	**No. of days**
0-10	6
10-20	4
20-30	5
30-40	5
40-50	3
50-60	4
60-70	2

The class size of the given data is
(1) 70 (2) 10
(3) 25 (4) None of these

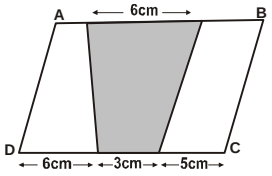
44. If the total length of diagonals of a cube is 12cm, what is the total length of edges of the cube?
(1) 15 cm
(2) 12 cm
(3) $12\sqrt{3}$ cm
(4) None of these

45. A girl walks to her school, she covers a distance of 800m in half an hour. So how much distance is covered by her in 10 minutes?
(1) 154.33m
(2) 266.67m
(3) 300.33m
(4) None of these

46. A person takes 2 days to make 30 boxes of match sticks. How many days will he take to make such 720 boxes?
(1) 64
(2) 48
(3) 120
(4) None of these

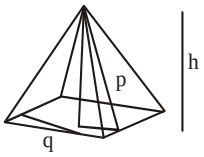
47. 2 men take 38 days to paint a house, if 6 more people are asked to paint the house, then within how many days they will finish the painting work?
(1) 15 days
(2) 9.5 days
(3) 19 days
(4) None of these

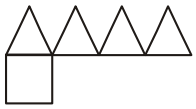
48. Find the area of the shaded region.



(1) 79 cm^2
(2) 50 cm^2
(3) 66.5 cm^2
(4) None of these

49. The square pyramid has h as the height of the pyramid, p as the altitude of the triangular face and q as the length of one side of the square base. If the pyramid is cut up as shown then which of the following equation (s) represents the total surface area of the pyramid?

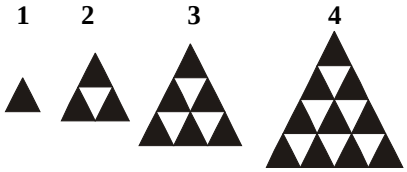




I. $q^2 + 2q.p$
II. $q^2 + 2q.h$
III. $q^2 + (q+2p)$

(1) I only
(2) II only
(3) I and II
(4) None of these

50. The figure below shows a pattern made with dark triangles



Which table shows the number of dark triangles for figures 5, 6 and 7 which are to be assumed?

(1)

Figure No.	Number of dark triangles
5	10 + 5
6	10 + 6
7	10 + 7

(2)

Figure No.	Number of dark triangles
5	10 + 5
6	15 + 6
7	21 + 7

(3)

Figure No.	Number of dark triangles
5	10 + 6
6	10 + 7
7	10 + 8

(4) None of these

END OF THE EXAM