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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.

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* # See prospectus/website for details

EHF NATIONAL INTERACTIVE MATHS OLYMPIAD

N I M O

10 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. The volume of a circular cylinder is 1100 cm^3 and the radius of its base is 5 cm. Its curved surface area is:
(1) 420 cm^2 (2) 440 cm^2
(3) 460 cm^2 (4) None of these

2. If in any code language, KUMAR is coded as LVNBS, how is EMOTIONAL coded in that language?
(1) FNQUJQBM (2) FNPUJPOBM
(3) GNPUNPOBM (4) None of these

3. How much 5% stock at 110 can be purchased for `2200?
(1) 2000 (2) 2200
(3) 2100 (4) None of these

4. 1 gallon is equal to:
(1) 5.55 litres (2) 4.55 litres
(3) 4.45 litres (4) None of these

5. Amit faces towards North. Turning to his right, he walks 25 metres. He then turns to his left and walks 30 metres. Next, he moves 25 metres to his right. He then turns to his right again and walks 55 metres. Finally, he turns to the right and moves 40 metres.
In which direction is he now from his starting point ?
(1) South-West (2) South
(3) South-East (4) None of these

Directions : (for question nos. 6 and 7) In each of the following questions, there is a certain relation between two given numbers on one side of : : and one number is given on another side of : : while another number is to be found from the given alternatives, having the same relation with this number as the numbers of the given pair bear. Choose the best alternative.

6. 7584 : 4251 : : 4673 : ?
(1) 1367 (2) 1340
(3) 1531 (4) None of these

7. 225 : 257 : : 289 : ?
(1) 301 (2) 316
(3) 325 (4) None of these

Direction (for question nos. 8 to 10) : Read the following information carefully and answer the questions that follows:

(i) P,Q,R,S,T and U are six students procuring their master's degree in six different subjects –English, History, Philosophy, Physics, Statistics and Mathematics.

(ii) Two of them stay in hostel, two stay as paying guest (PG) and the remaining two stay at their home.

(iii) R does not stay as PG and studies Philosophy.

(iv) The student studying statistics and history do not stay as PG.

(v) T studies Mathematics and S studies Physics.

(vi) U and S stay in hostel. T stays as PG and Q stays at home.

8. Who studies English?
(1) P (2) S
(3) T (4) None of these

9. Which of the following combinations of subject and place of stay is not correct?
(1) English- hostel (2) Mathematics-PG
(3) Philosophy- Home (4) None of these

10. Which of following pairs of student stay one each at hostel and at home?
(1) QR (2) SR
(3) US (4) None of these

MATHEMATICS

11. Which of the following is true about real numbers?
(1) Every rational number can be expressed in the form of $\frac{p}{q}$, where $q \neq 0$.
(2) Natural numbers, are those real, which are all negative, including zero.
(3) Integers excludes zero.
(4) None of these

12. The decimal expansion of the fraction $\left(3\frac{1}{7} - \frac{5}{7}\right)$ is
(1) 3.372 (2) –4.3
(3) 2.428 (4) None of these

13. Which of the following is a non-repeating, non-terminating decimal expansion?
(1) 10/3 (2) 7/2
(3) 22/7 (4) None of these

14. The sum of the zeroes of the $x^2 - 18x - 81 = 0$, is.
(1) 0 (2) 81
(3) 18 (4) None of these

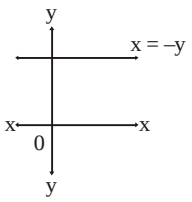
15. Which of the following is a correct statement?
(1) A quadratic equation always consists of identical zeroes.
(2) Roots of a polynomial, when put in the polynomial, it results in zero (number zero).
(3) Number of roots of a polynomial is greater than its degree.
(4) None of these

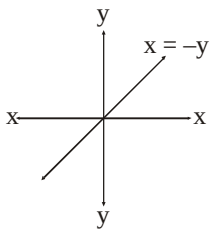
16. The remainder when the polynomial $f(x) = 4x^5 + 3x^3 - 1$ is divided by $(x - 2)$ is-
(1) 151 (2) $x^2 - 7$
(3) – 38 (4) None of these

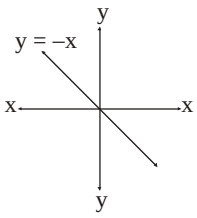
17. Mirror image of point (3, –9) along the x-axis is:
(1) (–3, 9) (2) (9,3)
(3) (–3, –9) (4) None of these

18. A point whose both co-ordinates are positive will be in:
(1) I Quadrant (2) II Quadrant
(3) III Quadrnat (4) IV Quadrant

19. Which graph represents the solution set of the given equation y = –x ?

(1) 

(2) 

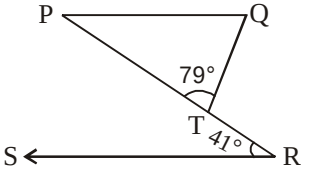
(3) 

(4) None of these

20. For what value of 'a' the given equation have $x = 1$ and $y = -1$ as a solution of $5x + 2ay = 3a$
(1) a = –1 (2) a = 2
(3) a = 1 (4) None of these

21. Three quantities x, y and z are in a continued proportion. If xz = 10201, find y.
(1) 121 (2) 102
(3) 101 (4) None of these

22. In the given figure, *PQ* is parallel to *RS*
What is the measure of $\angle PQT$?
(1) 90°
(2) 70°
(3) 60°
(4) None of these



23. If $\angle AOC = 2x + 1°$ and $\angle COB = 5x - 3°$, find the value of x for which AOB will be a line.

(1) 26° (2) 72°

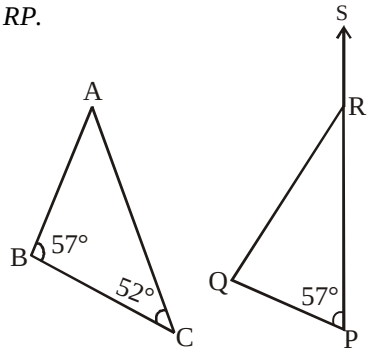
(3) 34° (4) None of these

24. If $\angle a$ is less than $\angle b$ by half of a right angle. Then for what value of 'a' and 'b' they are supplementary?

(1) a = 135.5, b = 44.5 (2) a = 95, b = 85

(3) a = 112.5, b = 67.5 (4) None of these

25. The given figure shows ΔABC and ΔPQR. Here, $AB = PQ$ and $BC = RP$.



What is the measure of $\angle SRQ$?

(1) 120° (2) 115°

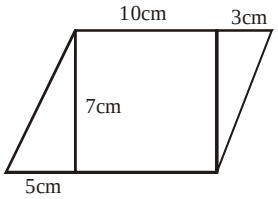
(3) 128° (4) None of these

26. An exterior angle of a triangle is 110° and one of the interior opposite angle is 40°. Then the other two angles of a triangle are

(1) 70°, 70° (2) 70°, 50°

(3) 80°, 30° (4) None of these

27. The area of the quadrilateral is:



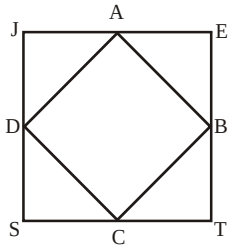
(1) $75m^2$

(2) $98m^2$

(3) $52m^2$

(4) None of these

28. Points A, B, C and D are mid-points of the sides of square JETS. If the area of JETS is 36sq. unit, the area of ABCD is-



(1) $9\sqrt{2}$ sq. units (2) $18\sqrt{2}$ sq. units

(3) 18 sq. units (4) None of these

29. An isosceles triangle has perimeter 30 cm and each of the equal sides is 12 cm. Find area of the triangle

(1) $25\sqrt{3}cm^2$ (2) $9\sqrt{15}cm^2$

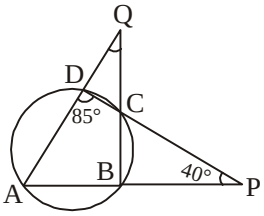
(3) $18\sqrt{3}cm^2$ (4) None of these

30. A traffic signal board is an equilateral triangle with side 'A'. Find the area of signal board whose perimeter is 180 cm.

(1) $900\sqrt{3}cm^2$ (2) $84\sqrt{15}cm^2$

(3) $164\sqrt{3}cm^2$ (4) None of these

31. Two sides AB and CD of a cyclic quadrilateral $ABCD$ are produced to meet at P. The sides AD and BC are produced to meet at Q. If $\angle ADC = 85°$ and $\angle BPC = 40°$ then $\angle BAD$ and $\angle CQD$ is



(1) 55°, 30° (2) 30°, 60°

(3) 45°, 65° (4) 75°, 85°

A dice is thrown 200 times and the following outcomes are noted, with their frequencies:

Outcome	1	2	3	4	5	6
Frequency	56	22	30	42	32	18

32. What is the probability of getting a 1 in the above case?

(1) 0.28 (2) 0.22

(3) 0.15 (4) None of these

33. What is the empirical probability of getting a number less than 4?

(1) 0.50 (2) 0.54

(3) 0.46 (4) None of these

34. What is the empirical probability of getting a number greater than 4?

(1) 0.32 (2) 0.25

(3) 0.18 (4) None of these

35. $\frac{Sin\,9^0}{Sin\,81^0}$ = is equal to:

(1) 2 (2) 3

(3) 1 (4) None of these

36. $Sin^2 5^o + Sin^2 10^o + Sin^2 15^o + ... + Sin^2 180^o =$

(1) 18 (2) 19

(3) 20 (4) None of these

37. *A* sells a bicycle to *B* at a profit of 20%, *B* sells it to *C* at a profit of 25%. If *C* pays `225 for it, the cost price of bicycle for *A*, is:

(2) `110 (2) `125

(3) `150 (4) None of these

38. 180 oranges are distributed among 70 boys and girls such that each boy gets 2 and each girl gets 3 oranges. The number of boys are:

(1) 70 (2) 25

(3) 30 (4) None of these

39. Twenty litres of a mixture contains milk and water in the ratio of 5 : 3. If four litres of this mixture is replaced by four litres of milk, then the ratio of the milk to that of the water in the container will be:

(1) 5 : 3 (2) 4 : 3

(3) 7 : 3 (4) None of these

40. What is the probability of getting a sum 10 from two throws of a dice?

(1) 1/16 (2) 1/12

(3) 1/20 (4) None of these

INTERACTIVE SECTION

Directions : (41 to 44)

A + B means 'A is father of B'
A - B means 'A is wife of B'
A × B means 'A is brother of B'
A ÷ B means 'A is daughter of B'

41. P ÷ R + S + Q, which of the following is true?

(1) P is daughter of Q (2) Q is aunt of P

(3) P is aunt of Q (4) None of these

42. If P - R + Q, which of the following is true?

(1) P is mother of Q (2) Q is daughter of P

(3) P is aunt of Q (4) None of these

43. P × R ÷ Q, which of the following is true?

(1) P is uncle of Q (2) P is father of Q

(3) P is son of Q (4) None of these

44. If P × R - Q, which of the following is true?

(1) P is brother in law of Q

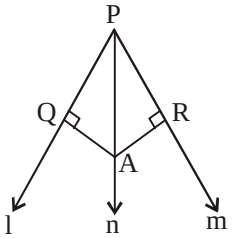
(2) P is brother of Q

(3) P is uncle of Q

(4) None of these

45. In the given figure, line *n* is the bisector of ∠*P*.

If *PA* = 17 cm and *PQ* = 15 cm, then what is the perimeter of quadrilateral *PQAR*?



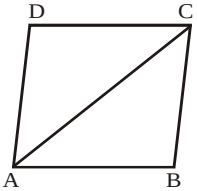
(1) 42 cm

(2) 46 cm

(3) 48 cm

(4) None of these

46. In the accompanying diagram of rhombus ABCD, ∠CAB=35°. Find ∠CDA.



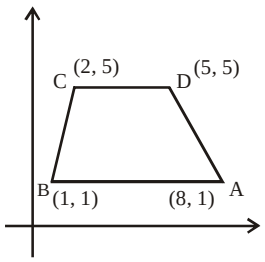
(1) 35

(2) 70

(3) 110

(4) None of these

47. Find the area of the trapezoid ABCD.



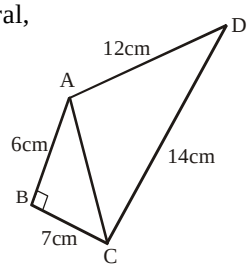
(1) 30 sq.units

(2) 25 sq.units

(3) 35 sq.units

(4) None of these

48. Find the area of the quadrilateral, given in the figure:



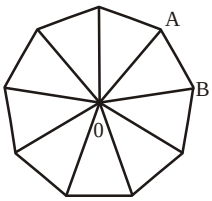
(1) $22\sqrt{6}$ cm^2

(2) $24(1+\sqrt{6})$ cm^2

(3) $23\sqrt{2}$ cm^2

(4) None of these

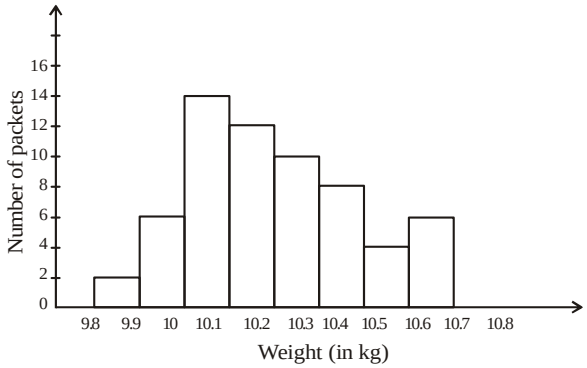
49. An umbrella is shaped (as shown in the figure) partially into a circle which is divided into 9 equal triangles, where the radius of the umbrella is 7 cm and the length of the side AB=8cm. The area of the cloth used to make the umbrella is:



(1) 52.67 cm^2 (2) $36\sqrt{33}$ cm^2

(3) $42\sqrt{65}$ cm^2 (4) None of these

50. In the given graph, how many packets were weighed?



(1) 9 (2) 14

(3) 62 (4) None of these

END OF THE EXAM