NATIONAL ROUND 2022

PRIMARY 4

IMOCSEA

INTERNATIONAL MATHEMATICS OLYMPIAD COMPETITION OF SOUTHEAST ASIA

Guidelines:

1. You have 90 minutes to finish the test.
2. You may write your solutions on the TEST BOOKLET.
3. Write your answers on the ANSWER SHEET.
4. After the test, you must SUBMIT to the proctor both the TEST BOOKLET and the ANSWER SHEET.
5. This test covers FOUR (4) CATEGORIES namely: ARITHMETIC & NUMBER THEORY, LOGICAL ANALYSIS, GEOMETRY, and COMBINATORICS.
6. This test has two parts: Multiple Choice Questions (the first twenty questions) and Short Answer Questions (the last eight questions). The first twenty (20) MCQs are worth 3 marks each and the last eight (8) SAQs are worth 5 marks each. The highest possible score is 100 marks. No point shall be deducted for incorrect answer.
7. You are NOT ALLOWED to use any calculating device during the test proper.
8. Any form of cheating is a ground for DISQUALIFICATION.

IMOCSEA MOCK TEST

Part I – Each question is worth 3 marks.

1. Find the value of N in the number sentence below.

   161 x 33 = 253 x N

   A. 77 B. 21 C. 69 D. 66

2. Glenn has a piece of construction paper, which measures 57 cm by 36 cm. If he will cut the paper, without any waste, into as many square pieces with the largest dimension possible, how many square pieces of paper can he make?

   A. 7 B. 218 C. 6 D. 12

3. Teacher Ray wrote three prime numbers on the board whose sum is 65. What could be the greatest value of the highest of the three primes?

   A. 43 B. 47 C. 53 D. 59

4. Mr. Kong wants to put fence posts, 4 meters apart, along three sides of his lot as shown below. How many posts can he put?

   A. 36 B. 35 C. 34 D.33

5. Find the sum of the numbers in the following series.

   2, 0, 2, 0, 2, 0, 2, 1, 2, 0, 2, 2, 2, 0, 2, 3, 2, 0, 2, 4, 2, 0, 2, 5, . . .2, 0, 2, 9

   A. 95 B. 85 C. 75 D. 65

6. Find the least value of n so that

   $1 + 2 + 3 + \ldots + n > 300$

   A. 24 B. 25 C. 26 D. 27

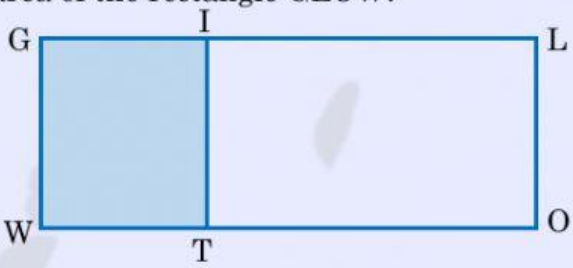
7. The average of a set of three numbers is 17, the average of a set of four numbers is 18, and the average of a set of five numbers is 21. What is the average of all the numbers when they are combined in a single set?

   A. 19.33 B. 18.67 C. 19.5 D. 19

8. What is the value of 143 x 143 + 2 x 157 x 143 + 157 x 157?

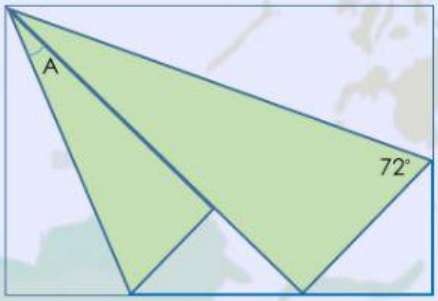
A. 90 000 B. 9 000 C. 45 098 D. 45 000

9. In the rectangle GLOW shown below, GL is thrice GI. If the shaded area is 32 cm^2, what is the area of the rectangle GLOW?



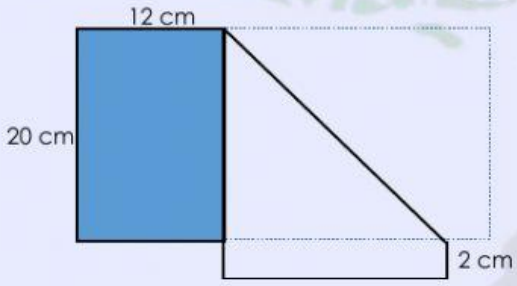
A. 64 cm^2 B. 96 cm^2 C. 160 cm^2 D. 128 cm^2

10. The figure shows a folded paper. Find the measure of angle A.



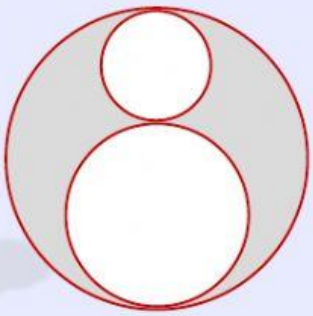
A. 18° B. 36° C. 27° D. 54°

11. Find the perimeter of the unfolded sheet of paper shown below.



A. 104 cm B. 108 cm C. 34 cm D. 68 cm

12. The two smaller circles with diameters 10 cm and 18 cm, respectively, are tangent to each other externally and are tangent internally to the third circle as shown in the figure. Find the area of the shaded region.



A. 90π cm^2 B. 81π cm^2 C. 196π cm^2 D. 106π cm^2

13. How many two digit numbers have ones greater than their tens digit?

A. 21 B. 28 C. 36 D. 45

14. In a party, there were thrice as many children as adults and thrice as many men as women. What is the ratio of children to men?

A. 1:1 B. 3:1 C. 9:1 D. 4:1

15. In a classroom, no student was born on Sunday. At least how many students are in the classroom if there were at least 4 students born on the same day?

A. 24 B. 19 C. 25 D. 18

16. If a line segment can be drawn between two points, how many line segment can you draw through 9 points?

A. 18 B. 72 C. 36 D. 24

17. There were 10 chess player in a tournament. Each player must play each of the other players only once. How many matches were made?

A. 50 B. 45 C. 55 D. 36

18. The operation Φ in a Φ b means $\frac{a+b}{a-b}$. Find the value of 2022 Φ 2020.

A. 4042 B. 2020 C. 2 D. 2021

19. Leni was born on May 8, 1990, a Tuesday. What day will she celebrate her birthday in 2025?

A. Tuesday B. Wednesday C. Thursday D. Friday

20. Observe the operations below.

What is the value of 3 x (+ +)?

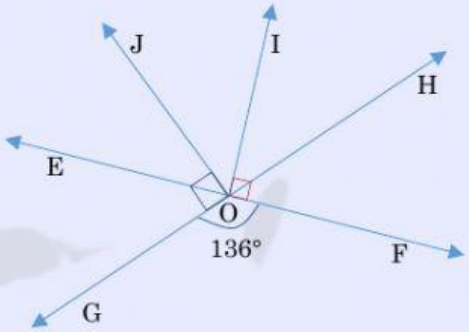
A. 130 B. 65 C. 195 D. 75

Part II – Each question is worth 5 marks.

1. What is the value of
100 + 98 + 96 + . . . + 52 - 40 - 42 - 44 - . . . - 88?

2. The ratio of apples to oranges to pears in a fruit stand is 4:5:8, respectively. If there were 36 more pears than apples, how many fruits are in the fruit stand?

3. In the figure below, ray OI is perpendicular to line EF and ray OJ is perpendicular to line GH. If ∠ GOF = 136°, find ∠JOI.

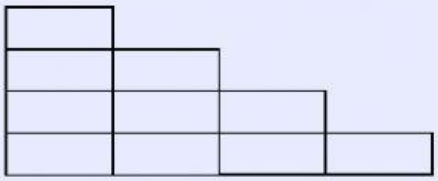


4. A circular wheel 60 cm in diameter rolls along a straight path that is 131.88 meters long. Find the number of turns it make to cover the whole distance.

5. Harry has 7 keys to unlock 7 doors. He has no initial idea on which key is fit for a particular door lock. At most, how many trials must Harry make to ensure that he fits each key to the right door lock?

6. A number of sandwiches in 6 variants were brought to a camp site. If each camper is offered to get 2 sandwiches , at least how many campers are there if two campers choose the same sandwiches?

7. How many rectangles are there in the figure below?



8. The number 306 000 has 3 terminal zeroes while 6 030 000 has four terminal zeroes. How many terminal zeroes are in the product of
   1 x 2 x 3 x 4 x 5 x . . . x 50?

- *End of Test* -