THAILAND INTERNATIONAL MATHEMATICAL OLYMPIAD FINAL ROUND 2020 – 2021

Kindergarten

Time allowed: 120 minutes

Question Paper

Instructions to Contestants:

1. Each contestant should have ONE Question-Answer Book which CANNOT be taken away.
2. There are 5 exam areas and 6 questions in each exam area. There are a total of 30 questions in this Question-Answer Book. Each question carries 5 marks. Total score is 150 marks. No points are deducted for incorrect answers.
3. All answers should be written on ANSWER SHEET.
4. NO calculators can be used during the contest.
5. All figures in the paper are not necessarily drawn to scale.
6. Write down the answer in the simplest form. If the calculation result is a fraction, please write down the answer as a proper or mixed fraction, decimal figure is also accepted. Marks will NOT be given for incorrect unit.
7. This Question-Answer Book will be collected at the end of the contest.

DO NOT turn over this Question-Answer Book without approval of the examiner.

Otherwise, contestant may be DISQUALIFIED.

All answers should be written on the ANSWER SHEET.

Open-Ended Questions (1^{st} ~30^{th}) (5 points for correct answer, no penalty point for wrong answer)

Logical Thinking

1. Jennifer is now playing "Clapping Game". When she needs to call any even numbers, she has to clap hands once instead of calling them out. Now the game starts from 1 in an ascending order. After clapping 7 times, what will the next number be?

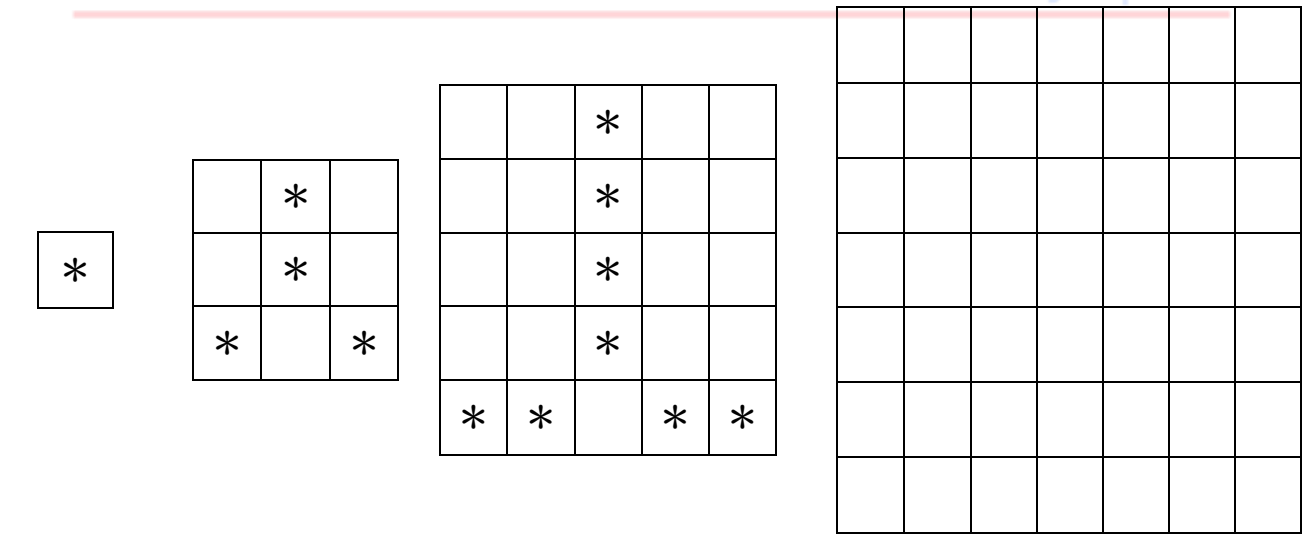
2. According to the pattern shown, what is the number in the space provided?
   1 、 2 、 4 、 5 、 7 、 8 、 10 、 11 、 13 、 __ 、….

3. Father is 37 years old now. Mother is 8 years younger than father. Andy is 25 years younger than mother. What is the total age of Andy's family given that his family has only 3 people?

4. According to the pattern shown, find the English letter in the space provided.
   B 、 E 、 H 、 K 、 N 、 __ 、….

5. According to the pattern shown, what is the number in the space provided?
   4 、 11 、 18 、 25 、 32 、 39 、 __ 、….

6. According to the pattern shown, how many ∗ is / are there in the 4^{th} group?



1^{st} Group 2^{nd} Group 3^{rd} Group 4^{th} Group

Arithmetic

7. Find the value of $2+0+2+1+2+0+2+1+2+0+2+1+2+0+2+1$.

8. If A is a 1-digit number, what is the value of A if the equation below is correct?

$$2\ 3\ -\ \boxed{A}\ =\ 1\ 7$$

9. Refer to the puzzle, find the value of A.

$$\begin{array}{rrr} & 2 & A \\ & 2 & A \\ + & 2 & A \\ \hline & 6 & 9 \end{array}$$

10. Find the value of $23+29+45+21+27$.

11. If B is a 1-digit number, what is the value of B if the equation below is correct?

$$1\ 6\ +\ 9\ -\ \boxed{B}\ =\ 1\ 7$$

12. Find the value of $21-23+25-27+29-31+33-35+37$.

Number Theory

13. Bruce has an even number of candies. Bruce eats 7 candies and exchanges 6 candies with Andy for 4 cans of coke. Determine whether the total number of Bruce's candies is odd or even now.

14. Fill the lines with ' + ' and ' – ' to make the equation below correct.
(Write down the complete equation on the answer sheet)

$$8 \_\_\_\_ 6 \_\_\_\_ 7 \_\_\_\_ 5 = 4$$

15. How many odd number(s) is / are there between 23 to 48?
(Including the first and the last number)

16. By observing the numbers, find the smallest 2-digit odd number of any two numbers added up.

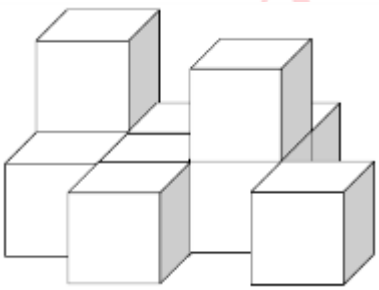
23、14、10、8、41、18、1

17. Peter has 23 candies and Alice has 5 candies. How many candy(ies) does Peter have to give Alice to make them have the same number of candies?

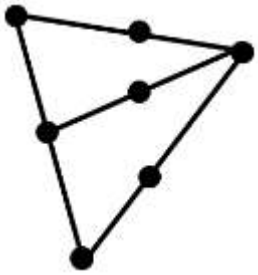
18. There are 5 to 8 strawberries in a pack. Mary buys 3 packs and the total number of strawberries is the number with unit digit 0. What is the maximum number of strawberries that she has?

Geometry

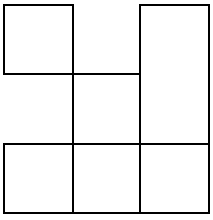
19. At least how many cube(s) is / are there in the figure below?



20. How many line segment(s) is / are there in the figure below?



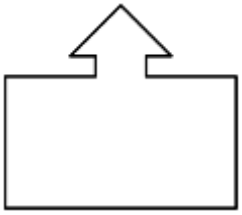
21. How many square(s) is / are there in the figure below?



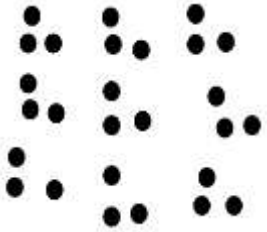
22. According to the pattern shown below, what is the figure in the space provided?

●▲■●▲■●▲■_▲...

23. How many side(s) is / are there in the polygon below?



24. How many dot(s) is / are there in the figure below?



Combinatorics

25. According to the followings, how many 2-digit odd number(s) is / are there?

19, 18, 47, 71, 53, 24, 701

26. Which number below is the largest?

20210403 、 20201230 、 2021502 、 2021134

27. What is the smallest 3-digit odd number formed by digits 2, 3, 6 and 7? (Each number can only be used once)

28. Alice has 11 $2 coins. At most how many $5 coin(s) can she exchange?

29. According to the following answers, what is the difference between the number(s) of 1-digit number(s) and 2-digit number(s)?

$17+13$, $8-3$, $7+3$, $18-13$, $12+71$

30. Arranging the following numbers in descending order (From the largest to the smallest), find the value of 3rd largest number.

31, 48, 36, 24, 38

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