Name:____________________________________________________________

School:____________________________________________________________

INSTRUCTIONS:

1. Please **DO NOT OPEN** the contest booklet until the Proctor has given permission to start.

2. **TIME**: 1 hour and 30 minutes

3. There are 30 questions in this paper. 3 points, 4 points and 5 points will be awarded for each correct question in Section A, Section B and Section C respectively. No points are deducted for Unanswered question. 1 point is deducted for Wrong answer.

4. Shade your answers neatly in the answer entry sheet.

5. **PROCTORING**: No one may help any student in any way during the contest.

6. **No calculators** are allowed.

7. All students must fill and shade in your **Name, Index number, Level and School** in the Answer sheet provided.

8. **MINIMUM TIME**: Students must stay in the exam hall for at least 1 hour and 15 minutes.

9. Students must show detailed working and transfer answers to the answer entry sheet.

10. No spare papers can be used in writing this contest. Enough space is provided for your working of each question.

11. You must return this contest paper to the proctor.
Section A  (Correct – 3 points | Unanswered – 0 points | Wrong – deduct 1 point)

Question 1
Four cards lie in a row as shown in the picture below. Which card arrangement is impossible to obtain if you swap the position of 1 pair of cards?

(A) 2 7 1 0  (B) 0 1 2 7  (C) 1 0 2 7
(D) 0 2 1 7  (E) 2 0 7 1

Question 2
A fly has 6 legs and a spider has 8 legs. The total number of legs that 3 flies and 2 spiders have is the same number of legs as 9 chickens and some cats. How many cats are there?

(A) 2 cats  (B) 3 cats  (C) 4 cats  (D) 5 cats  (E) 6 cats

Question 3
Alice has 4 pieces of this figure: 
Which shape below cannot be formed from the 4 pieces that Alice has?

(A)  (B)  (C)
(D)  (E)

Question 4
Kalle knows that $1111 \times 1111 = 1234321$. What is the product of $1111 \times 2222$?

(A) 3456543  (B) 2345432  (C) 2234322  (D) 2468642  (E) 4321234
Question 5
On a planet there are 10 islands and 12 bridges. If all bridges are open, what is the smallest number of bridges that must be closed in order to stop the traffic between A and B?

(A) 1  (B) 2  (C) 3  (D) 4  (E) 5

Question 6
3 Rhinos named Jane, Kate and Lynn went for a walk. Jane was infront of Kate, and Lynn was behind Kate. Jane weighs 500 kg more than Kate. Kate weighs 1000 kg less than Lynn. Which of the following pictures shows Jane, Kate and Lynn in the right order?

(A)  (B)  (C)  (D)  (E)

Question 7
A special dice has a number on each face. The sums of the numbers on opposite faces are all equal. Five of the numbers are 5, 6, 9, 11 and 14. What is the number on the sixth face?

(A) 4  (B) 7  (C) 8  (D) 13  (E) 15
Question 8
Martin wants to colour the squares of the rectangle so that 1/3 of all squares are blue and half of all squares are yellow. The rest of the squares are to be coloured red. How many squares will he colour red?

(A) 1  (B) 2  (C) 3  (D) 4  (E) 5

Question 9
While Peter solves 2 problems in the "Kangaroo" contest, Nick manages to solve 3 problems. The boys solved 30 problems in total. How many more problems did Nick solve than Peter?

(A) 5  (B) 6  (C) 7  (D) 8  (E) 9

Question 10
Bob folded a piece of paper, used a hole puncher and punched exactly one hole in the paper. Bob unfolded the paper as shown in the picture below. Which of the following shows the folded lines on the paper that Bob had initially started with?

(A)  (B)  (C)  (D)  (E)

Section B  (Correct – 4 points | Unanswered – 0 points | Wrong – deduct 1 point)

Question 11
The Modern Furniture store is selling sofas, loveseats and chairs made from identical modular pieces as shown in the picture below. Only 1 pair of armrests are on the sides of each furniture and all armrests have the same width. The width of the sofa is 220 cm and the width of the loveseat is 160 cm. What is the width of the chair?

(A) 60 cm  (B) 80 cm  (C) 90 cm  (D) 100 cm  (E) 120 cm
Question 12
5 different keys fit into the 5 different padlocks in the picture below. The numbers on the keys refer to the letters on the padlocks. What is written on the last key?

(A) 382  (B) 282  (C) 284  (D) 823  (E) 824

Question 13
Tom writes all the numbers from 1 to 20 in a row and obtains the 31-digit number: 1234567891011121314151617181920
Then he deletes 24 of the 31 digits such that the remaining number is as large as possible. Which number does he get?

(A) 9671819  (B) 9567892  (C) 9781920
(D) 9912345  (E) 9818192

Question 14
Morten wants to rebuild the construction below into a regular box. Each piece of cube that form the construction below has a length of 1cm. What is the smallest dimension of a box he can form?

(A) 3 × 3 × 4  (B) 3 × 5 × 5  (C) 3 × 4 × 5  (D) 4 × 4 × 4  (E) 4 × 4 × 5

Question 15
When we add the numbers in each row and along the columns we get the results as in the table below. Which statement is true?

\[
\begin{array}{cc}
a & b \\
c & d \\
\end{array} \rightarrow 2
\]

\[
\begin{array}{cc}
a & b \\
1 & 4 \\
\end{array} \rightarrow 3
\]

(A) \( a \) is equal to \( d \)  (B) \( b \) is equal to \( c \)  (C) \( a \) is greater than \( d \)
(D) \( a \) is less than \( d \)  (E) \( c \) is greater than \( b \)
Question 16
Peter went hiking in the mountains for 5 days. He started on Monday and his last trip was on Friday. Each day he walked 2 km more than the day before. When his trip was over, his total distance was 70 km. What is the distance covered by Peter on Thursday?

(A) 12 km      (B) 13 km      (C) 14 km      (D) 15 km      (E) 16 km

Question 17
There is a picture of a kangaroo in the first triangle from the left. The dotted lines act as mirrors. The first 2 reflections are shown. What does the reflection look like in the shaded triangle?

(A)  (B)  (C)  (D)  (E)

Question 18
Soo Ching has some amount of money and 3 magic wands that he can only use once. The properties of each wand is shown below:

- Adds 1 dollar
- Subtracts 1 dollar
- Doubles the amount

In what order must he use these wands to obtain the largest amount of money?

(A)  (B)  (C)  (D)  (E)
Question 19
Rafael has three squares. The first square has a side length of 2 cm. The second square has a side length of 4 cm and its vertex is placed in the center of the first square. The last square has side length 6 cm and its vertex is placed in the center of the second square, as shown in the picture. What is the area of the figure?

(A) 32 cm²  (B) 51 cm²  (C) 27 cm²  (D) 16 cm²  (E) 6 cm²

Question 20
Four players scored goals in a handball match. All of them scored a different number of goals. Among the four players, Mike was the one who scored the least number of goals. The other three have scored 20 goals in total. What is the greatest number of goals Mike could have scored?

(A) 2  (B) 3  (C) 4  (D) 5  (E) 6

Section C  (Correct – 5 points | Unanswered – 0 points | Wrong – deduct 1 point)

Question 21
A bar consists of 2 grey cubes and 1 white cube glued together as shown in the figure below. Which cube can be built from 9 such bars?

(A)  (B)  (C)  (D)  (E)

Question 22
The numbers 1, 2, 3, 4, and 5 have to be written in the five cells in the figure in the following way: If a number is just below another number, it has to be greater. If a number is just to the right of another number, it has to be greater. How many ways can this be done?

(A) 3  (B) 4  (C) 5  (D) 6  (E) 8
Question 23
8 kangaroos stood in a line as shown in the diagram below. At some point, two kangaroos standing side by side and facing each other exchanged places by jumping past each other. This was repeated until no further jumps were possible. How many exchanges were made?

(A) 2  (B) 10  (C) 12  (D) 13  (E) 16

Question 24
Monica has to choose 5 different numbers. She has to multiply some of them by 2 and some by 3 in order to get the smallest number of different results. What is the least number of results she can obtain?

(A) 1  (B) 2  (C) 3  (D) 4  (E) 5

Question 25
The square floor in the picture is covered by triangular and square tiles in grey or white. What is the smallest number of grey tiles, that must be swapped with white tiles, so that the pattern looks the same from each of the four directions shown by the arrows below?

(A) Three triangles, one square  (B) One triangle, three squares
(C) One triangle, one square  (D) Three triangles, three squares
(E) Three triangles, two squares

Question 26
A bag contains red marbles and green marbles. For every 5 marbles Jackie picks, at least one marble is red. For every 6 marbles Jackie picks, at least one marble is green. What is the largest number of marbles that the bag can contain?

(A) 11  (B) 10  (C) 9  (D) 8  (E) 7
Question 27
Abigail likes even numbers, Betty likes numbers that are divisible by 3 and Celina likes numbers that are divisible by 5. Each of the three girls went separately to a basket containing 8 balls with numbers written on them, and took all the balls with numbers they like. It turned out that Abigail collected balls with the numbers 32 and 52, Betty collected balls with the numbers 24, 33 and 45, Celina collected balls with the numbers 20, 25 and 35. In what order did the girls approach the basket?

(A) Abigail, Celina, Betty  (B) Celina, Betty, Abigail  (C) Betty, Abigail, Celina
(D) Betty, Celina, Abigail  (E) Celina, Abigail, Betty

Question 28
John wants to write a whole number on each box at the diagram below, such that the sum of any two numbers in the adjacent boxes is equal to the number directly above it. What is the largest number of odd numbers that John can write?

(A) 4  (B) 5  (C) 6  (D) 7  (E) 8

Question 29
Julia has four different coloured pencils. She wants to use some or all of them to colour the map of an island, divided into four nations as shown in the picture below. If the map of two nations with a common border cannot have the same colour, how many ways can she colour the map?

(A) 12  (B) 18  (C) 24  (D) 36  (E) 48

Question 30
There is a lamp in each square of a $6 \times 6$ board. If two lamps have a common side in the board, they are known as neighbours. In the beginning, some lamps are switched on. Every minute, each lamp will be switched on if they have at least two neighboring lamps that are on. What is the minimum number of lamps that need to be switched on at the start, in order to ensure that all lamps will be lit at some point of time?

(A) 4  (B) 5  (C) 6  (D) 7  (E) 8
Rough Working
Rough Working