2020 小學組 Primary Division

姓名 Name_____

學校 School_____ 座位編號 Seat Number_____

此卷有 20 道題目：

I. 題 1 – 9 道是選擇題，每題 5 分，只須在方格 填寫英文字母：**A,B,C, D, E**。

II. 題 10 – 20 是填空題，每題 8 分，只須填寫正確答案，不須填寫過程。

There are 20 questions:

I. Questions 1 – 9 are multiple-choice, 5 marks each.
Fill in **A, B, C, D, E** in the boxes provided.

II. Questions 10 – 20 are fill-in-blanks, 8 marks each.
Fill in final answers, and no steps are needed.

I 選擇題 每題 5 分　　Multiple Choice Questions　5 marks each

1. 奇數的平方被 8 除後所得的餘數是
When the square of an odd number is divided by 8, the remainder is
A. 1　**B.** 3　**C.** 5　**D.** 7　**E.** 以上皆非 None of the above. ☐

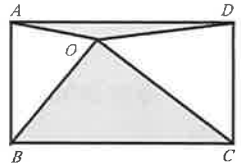
2. 6 個字母 M, A, C, A, U, O 排成一排，求不同排法的個數。
Number of different ways to arrange letters M, A, C, A, U, O in a row is
A. 20　**B.** 25　**C.** 30　**D.** 45　**E.** 以上皆非 None of the above. ☐

3. 求 2020^2 的正因數的個數。
Find the number of positive factors of 2020^2.
A. 20　**B.** 25　**C.** 30　**D.** 45　**E.** 以上皆非 None of the above. ☐

4. $69.708 \div 58.09 =$
A. 1.1　**B.** 1.15　**C.** 1.2　**D.** 1.25　**E.** 以上皆非 None of the above. ☐

5. 定義 $X \heartsuit Y = \dfrac{1}{X+2Y} + \dfrac{4}{2X+3}$，則 $1 \heartsuit 2 + 3 \heartsuit 1 =$
Define $X \heartsuit Y = \dfrac{1}{X+2Y} + \dfrac{4}{2X+3}$, then $1 \heartsuit 2 + 3 \heartsuit 1 =$
A. 0　**B.** 1　**C.** 2　**D.** 3　**E.** 以上皆非 None of the above. ☐

6. 試找出不能表示為三個素數之和的最小兩位數 N。
Find the least 2-digit number N which cannot be expressed as a sum of 3 primes.
A. 25　**B.** 55　**C.** 57　**D.** 58　**E.** 以上皆非 None of the above. ☐

7. 若 S, T 為長方形 $ABCD$ 內的白色及塗色區域的面積，則
If S, T are areas of white and colored regions in rectangle $ABCD$, then


A. $S > T$　**B.** $S < T$　**C.** $S = T$　**D.** $S \neq T$
E. 以上皆非 None of the above. ☐

8. 某比賽有 10 道題，答對一題得 3 分，答錯一題扣 2 分，未答的題得 0 分。已知小明答題的數目是奇數，賽後得分為 11 分，求小明答對題目的數目。
There are 10 questions in a contest. 3 marks are awarded for every correct answer, 2 marks are deducted for every wrong answer, and no mark is given for every unanswered question. The number of questions Ming answered is odd, and Ming's total marks is 11. Find the number of Ming's correct answers.
A. 3　**B.** 4　**C.** 5　**D.** 6　**E.** 以上皆非 None of the above. ☐

9. 有三人 X, Y, Z，每人或者是誠實人，或者是騙子。
X 說："我們是騙子。"　Y 說："我們中間恰好有一個是誠實人。"
問以下那個選擇是對的。
Each of 3 persons X, Y, Z is either an honest man or a liar.
X said "All of us are liars. "
Y said "Only one of us is an honest man."
Which of the following is true:
A. X 是誠實人 X is an honest man　**B.** Y 是騙子 Y is a liar
C. Z 是誠實人 Z is an honest man　**D.** Z 是騙子 Z is a liar
E. 以上皆非 None of the above. ☐

題目 10-20 在背面。　Questions 10-20 are at the back.

III 填空題 每題 8 分　　Fill-in-blank Questions　8 marks each

10. 小盒可裝至多 5 支筆，大盒可裝至多 12 支筆。現要 A 個大盒及 B 個小盒恰好裝載 99 支筆，且多於 10 個小盒。求 $A+B$ 的最小值 M。
Small box can pack at most 5 pens, and big box can pack at most 12 pens. It requires A big boxes and B small boxes to pack 99 pens exactly, and there are more than 10 small boxes. Find the minimum value M of $A+B$.

$M=$

11. 從 $1,2,3,\cdots,9$ 選出 8 個不同的數字，排成一個能被 12 整除的 8 位數 N，求 N 的最大值。
Choose 8 different digits from $1,2,\cdots,9$ to form a 8-digit number N such that N is divisible by 12. Find the largest N.

$N=$

12. 已知 $\frac{n}{m}=0.2020\cdots$，其中 m、n 都是正整數，求 m 的最小值。
Given m,n are positive integers such that $\frac{n}{m}=0.2020\cdots$, find the smallest m.

$m=$

13. 從 1, 2, 3, $\cdots$, 2019, 2020 取出 n 個不同的數，使得其中每兩個之差不等於 4。求所有可能 n 的最大值 N。
Choose n different numbers from $1,2,\cdots,2020$, such that the difference of any two chosen number is not equal to 4. Find the largest value N of all possible n.

$N=$

14. 化簡分數 $\frac{1-23}{3-12}+\frac{31-2}{21-3}$ 後得 $\frac{P}{Q}$，求 $P+Q$。
After simplifying fraction $\frac{1-23}{3-12}+\frac{31-2}{21-3}$, we obtain $\frac{P}{Q}$. Find $P+Q$.

$P+Q=$

15. 計算　Evaluate $S=\frac{1}{1+2}+\frac{1}{1+2+3}+\cdots+\frac{1}{1+2+\cdots+2019}$

$S=$

16. 足球賽門票 15 元一張，降價後觀眾增加了 50%，收入增加了 20%。問：降價後一張門票是多少元？
The ticket of a football match is \$15. If the ticket price is reduced, the number of the tickets sold increases by 50%, and the total revenue increases by 20%. What is the ticket price T after reduction?

$T=$

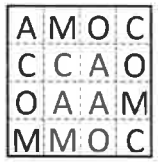
17. 定義 N 的立方為 $N\times N\times N$，記為 N^3。例如 $2^3=2\times2\times2=8$。試求四個連續正整數使得最大數的立方是其餘三個數的立方之和。
Define the cube of N to be the product $N\times N\times N$, denoted by N^3. For example $2^3=2\times2\times2=8$. Find 4 consecutive positive integers such that the cube of the largest one is the sum of the cubes of remaining 3 numbers.

$(\quad)^3+(\quad)^3+(\quad)^3=(\quad)^3$

18. 三數 A,B,C 的和等於 235，A 比 B 大 80，C 比 A 小 90。求這三個數的最大公因數與最小公倍數之和 S。
The sum of 3 numbers A,B,C is 235. A is 80 more than B. And C is 90 less than A. Find the sum S of the highest common factor and the lowest common multiple of the 3 numbers.

$S=$

19. 用實線 把右圖的正方形分成形狀相同的四塊，使得每塊恰好有 M,A,C,O 四個英文字母。
Divide the square with solid lines on the right into 4 pieces of same shapes such that each piece contains 4 letters M,A,C,O.



20. 從 +, −, ×, ÷, ( ), [ ] 中，可重覆選取合適的符號填進式子，使得等號成立：
Choose symbols from +, −, ×, ÷, ( ), [ ] repeatedly to fill in the following expression such that the equality holds:

$1\quad2\quad3\quad4\quad5\quad6\quad7\quad8\quad9\quad=1$