

Comórtas Sóisearach Matamaitice Éireann 2017

Organised on behalf of

The Irish Mathematics Teachers Association
(IMTA)

First Round

Time : 40 minutes

Instructions

1. Do not open the examination until you are told to do so.
2. **You are permitted to use a calculator but not graph (squared) paper.** You may use rulers, compasses and paper for rough work.
3. Be certain that you understand the coding system for your answer sheet. If you are not sure, ask your teacher to explain it.
4. This is a multiple choice test. Each question is followed by five possible answers marked **A,B,C,D** and **E**. Only one of these is correct. When you have decided on your choice, enter the appropriate letter on your answer sheet for that question.
5. **Scoring:**
Each answer is worth 5 marks in Section A, 6 marks in Section B, and 8 marks in Section C.
There are no marks for incorrect answers or unanswered questions
6. Diagrams are not drawn to scale. They are intended as aids only.
7. When your teacher instructs you to begin, you will have 40 minutes of working time.

Section A (5 Marks)

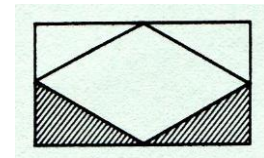
- 1) Which of these is not a prime number?
- (A) 3 (B) 5 (C) 7 (D) 9 (E) 11

- 2) Which of these is not equal to 10?
 (A) 20×0.5 (B) $(5 - 3) \times 5$ (C) $1 + 4 \times 2$ (D) $40 \div 4$ (E) 100×0.1
- 3) The value of $\frac{3 \times 5}{9 \times 11} \times \frac{7 \times 9 \times 11}{3 \times 5 \times 7}$ is
 (A) 0 (B) 1 (C) 49 (D) $\frac{1}{49}$ (E) 50
- 4) Sarah used a calculator to find the product of 0.075×2.56 . She forgot to enter the decimal points. The calculator showed 19200. If Sarah had entered the decimal points correctly, the answer would have been.
 (A) 0.0192 (B) 0.192 (C) 1.92 (D) 19.2 (E) 192
- 5) $0.4 + 0.02 + 0.006$ is equal to
 (A) 0.012 (B) 0.066 (C) 0.12 (D) 0.24 (E) 0.426

Section B (6 Marks)

- 6) Joe has two pieces of string, each 12 cm long. With one piece he forms a rectangle whose width is double its length. With the other piece he forms a square.
 What is the ratio of the area of the square to the area of the rectangle.
 (A) 1 : 1 (B) 2 : 1 (C) 3 : 4 (D) 4 : 3 (E) 9 : 8

- 7) The midpoints of the sides of a rectangle are joined as shown.
 The fraction of the rectangle which is shaded is



- (A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{1}{4}$ (D) $\frac{1}{6}$ (E) $\frac{1}{8}$
- 8) A 2 cm cube (2 cm x 2 cm x 2cm) of silver is worth €40.
 At the same rate how many euros is a 3 cm cube (3 cm x 3 cm x 3 cm) worth?
 (A) 60 (B) 90 (C) 120 (D) 135 (E) 270
- 9) In a certain country three fish can be traded for two loaves of bread and a loaf of bread can be traded for four bags of rice.
 How many bags of rice is one fish worth?

- (A) $\frac{3}{8}$ (B) $\frac{1}{2}$ (C) $\frac{3}{4}$ (D) $2\frac{2}{3}$ (E) $3\frac{1}{3}$
- 10) In the product shown B is a digit

$$\begin{array}{r} B2 \\ \times 7B \\ \hline 6396 \end{array}$$

The value of B is

- (A) 3 (B) 5 (C) 6 (D) 7 (E) 8

Section C (8 Marks)

- 11) If you write 105 as the sum of ten consecutive whole numbers the largest of these ten numbers is
- (A) 11 (B) 12 (C) 13 (D) 14 (E) 15
- 12) A test has two parts. The first part is worth 60% and the second part is worth 40%.
If a student gets 95% of part one correct, what percentage must this student get in part two in order to achieve an average of 90% for the whole test?
- (A) 50 (B) 65 (C) 77.5 (D) 82.5 (E) 92.5
- 13) The sum of consecutive whole numbers from -22 to a certain number, x , inclusive, is 98. What is the value of x ?
- (A) 23 (B) 26 (C) 50 (D) 75 (E) 94
- 14) The pages of a book are numbered consecutively 1, 2, 3 ... and so on.
No pages are missing.
If the digit 3 occurs 99 times, what is the number of the last page?
- (A) 330 (B) 331 (C) 332 (D) 333 (E) 334
- 15) There is a list of seven numbers. The average of the first four numbers is 5, and the average of the last four numbers is 8.
If the average of all seven numbers is $6\frac{4}{7}$, then the number common to both sets of four numbers is
- (A) $5\frac{3}{7}$ (B) 6 (C) $6\frac{4}{7}$ (D) 7 (E) $7\frac{3}{7}$.



Comórtas Sóisearach Matamaitice Éireann
(Irish Junior Mathematics Competition) 2017

ANSWER KEY (ROUND 1)

SECTION A

1. D
2. C
3. B
4. B
5. E

SECTION B

6. E
7. C
8. D
9. D
10. E

SECTION C

11. E
12. D
13. B
14. C
15. B



Comórtas Sóisearach Matamaitice Éireann 2017

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FINAL

Time : 1 HOUR

Instructions

1. Do not open the examination until you are told to do so.
 2. **You are permitted to use a calculator** The use of **graph (squared) paper** is **not allowed**. You may use rulers, compasses and paper for rough work.
 3. Be certain that you understand the coding system for your answer sheet. If you are not sure, ask the supervisor to explain it.
 4. This is a multiple choice test. Each question is followed by five possible answers marked **A,B,C,D** and **E**. Only one of these is correct. When you have decided on your choice, enter the appropriate letter on your answer sheet for that question.
 5. **Scoring:** Each answer is worth 5 marks in Section A, 6 marks in Section B, and 8 marks in Section C. each unanswered or incorrect answer receives no mark.
 6. Diagrams are not drawn to scale. They are intended as aids only.
 7. Please do not begin until you are instructed , you will have **1 HOUR** of working time.
- Section A (5 Marks)**
- 1) The value of $2.46 \times 8.163 \times (5.17 + 4.829)$ is closest to
(A) 100 (B) 200 (C) 300 (D) 400 (E) 500
 - 2) When the fraction $\frac{49}{84}$ is expressed in simplest form, the sum of the numerator and denominator will be

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- (A) 11 (B) 17 (C) 19 (D) 33 (E) 133
- 3) $4(299) + 3(299) + 2(299) + 298$ is equal to
 (A) 2889 (B) 2989 (C) 2991 (D) 2999 (E) 3009
- 4) Jo needs to catch a bus at 7.30 am. She takes 25 minutes to get ready and 10 minutes to walk to the bus stop from home.
 In order to catch the bus, what is the latest time she should get up?
 (A) 6:45 (B) 6:55 (C) 7 (D) 7:05 (E) 7:10
- 5) A new section of estate is being built and the builder is buying house numbers. The houses are to be numbered from 190 to 212 inclusive.
 How many zeros will the builder need to buy?
 (A) 4 (B) 10 (C) 12 (D) 13 (E) 22
- 6) A car was exactly 12 km from Cork at 7:00 pm. It travels towards Cork at a constant speed of 45 km/h.
 At what time does the car reach Cork?
 (A) 7.12 (B) 7.14 (C) 7.16 (D) 7.33 (E) 7.45
- 7) Which of these numbers is between $\frac{1}{5}$ and $\frac{1}{6}$?
 (A) 0.14 (B) 0.15 (C) 0.16 (D) 0.17 (E) 0.26
- 8) The value of $2 - (\frac{1}{2} + \frac{2}{3})$ is
 (A) $\frac{1}{3}$ (B) $\frac{5}{8}$ (C) $\frac{5}{6}$ (D) $\frac{7}{6}$ (E) $\frac{7}{5}$
- 9) Given that 8 is 10% of X and 20 is 50% of Y what is the value of $\frac{X}{Y}$.
 (A) $\frac{2}{25}$ (B) $\frac{1}{2}$ (C) $\frac{4}{5}$ (D) 2 (E) 8
- 10) What is the largest difference that can be formed by subtracting two numbers chosen from the set $\{-16, -4, 0, 2, 4, 12\}$?
 (A) 10 (B) 12 (C) 16 (D) 28 (E) 48

Section B (6 Marks)

- 11) Half the people in a room left. One third of those remaining started to dance.

There were 12 people who were not dancing.
The original number of people in the room was

- (A) 24 (B) 30 (C) 36 (D) 42 (E) 72

12) The sides of a cube are doubled in length to form a larger cube.
The number of original small cubes that will fill this larger cube is

- (A) 2 (B) 4 (C) 6 (D) 8 (E) 16

13) In making a lawn fertiliser, a manufacturer blends nitrogen, phosphoric acid and potash in the ratio 3 : 8 : 17.
If 6 kg of nitrogen is used in the mixture, the amount of potash used, in kg, is

- (A) 16 (B) 18 (C) 34 (D) 48 (E) 102

14) When 1.732 is rounded to the nearest whole number, how much greater is the result than when 1.732 is rounded to the nearest tenth?

- (A) 0.1 (B) 0.2 (C) 0.3 (D) 0.4 (E) 0.5

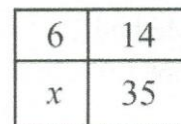
15) I think of a number, multiply it by 2, add 2, divide by 2 and then subtract 2.
Then answer I get is 2. What was the original number?

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

16) The total price of 6 equally priced biros is €4.50. When the cost per biro is increased by 50 cents, how much, in euros, will 15 of these biros cost at the new rate?

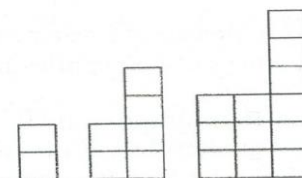
- (A) 10 (B) 11.25 (C) 18.75 (D) 19 (E) 19.50

17) A rectangle is broken up into four rectangles by line segments parallel to its sides. The areas of three of these rectangles are given in the diagram.
The area of the fourth rectangle is x . The value of x is



- (A) 10 (B) 15 (C) 20 (D) 21 (E) 25

18) The first three towers in a pattern are shown.
If the pattern continues how many blocks are in the 99th tower?



- (A) 9900 (B) 9816 (C) 9818 (D) 9919 (E) 9801

- 19) Starting with a green bead, coloured beads are placed on a string according to the pattern **green, red, blue, yellow, white, orange**.
If this pattern continues, what is the colour of the 2017th bead?
- (A) green (B) red (C) blue (D) yellow (E) white
- 20) You are offered two plans for text messages. Plan A offers unlimited texting for €20 a month. Plan B charges €5 monthly plus an additional charge of 5 cents for each text message. How many text messages would a Plan B user need to send for the monthly charges to be exactly the same?

(A) 100 (B) 200 (C) 300 (D) 400 (E) 500

Section C (8 Marks)

- 21) In order for Maureen to walk a kilometre in her rectangular back yard, she must walk the length 25 times or walk its perimeter 10 times.
What is the area of Maureen's back yard in square meters?
- (A) 40 (B) 200 (C) 400 (D) 500 (E) 1000
- 22) If each of the three operations signs, +, -, x, is used exactly ONCE in one of the blanks in the expression
 $5 _ 4 _ 6 _ 3$ then the result could equal
- (A) 9 (B) 10 (C) 15 (D) 16 (E) 19
- 23) Two distinct circles and two distinct straight lines lie in the same plane.
What is the maximum number of points of intersection possible?
- (A) 7 (B) 11 (C) 12 (D) 14 (E) 16
- 24) A householder buys candles a hundred at a time. She burns one candle every day and always makes one new one from the remaining wax of seven burnt candles.
After how many days will she have to buy new candles?
- (A) 112 (B) 114 (C) 115 (D) 116 (E) 117
- 25) The number on a licence plate has three digits. The product of the digits is 216 and their sum is 19.
What is the greatest three-digit number that could be on the licence plate
- (A) 839 (B) 893 (C) 938 (D) 946 (E) 964

I.M.T.A.



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ANSWER KEY (Final)

SECTION A

1. B
2. C
3. B
4. B
5. D
6. C
7. D
8. C
9. D
10. D

SECTION B

11. C
12. D
13. C
14. C
15. C
16. C
17. B
18. A
19. A
20. C

SECTION C

21. C
22. E
23. B

- 24. D
- 25. E