

Comórtas Sóisearach Matamaitice Éireann 2016

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) 13 thousands + 13 hundreds + 13 ones is equal to
- (A) 1313 (B) 1413 (C) 14313 (D) 14413 (E) 131313

- 2) A man needs six pieces of wire, each 218 cm long,
Wire is sold by the metre.
How many metres of wire must the man buy?
- (A) 13 (B) 14 (C) 15 (D) 18 (E) 1308
- 3) The average of three numbers is 20. Suppose the first number is increased by 1, the second number is increased by 2, and the third number is increased by 3.
The average of the three numbers has been increased by
- (A) 1 (B) 2 (C) 3 (D) 4 (E) 6
- 4) I have a €10 note and a bag of crisps costs €2.20, how many bags of crisps could I buy?
- (A) 3 (B) 4 (C) 5 (D) 6 (E) 7
- 5) A train is scheduled to leave a station at 10:14 am and it takes 2 hours and 47 minutes to arrive at its destination. If the train leaves 8 minutes late, at what time does it arrive?
- (A) 7:28 am (B) 7:35 am (C) 12:09 pm (D) 1:01 pm (E) 1:09 pm

Section B (6 Marks)

- 6) A snail has fallen into a 10m deep hole. It started climbing up. Every day it would climb 3m up but then it would fall 2m down while sleeping during the night.
After how many days will the snail just reach the top of the hole?

(A) 6 (B) 7 (C) 8 (D) 9 (E) 10

- 7) What is the value of

$$\frac{1}{3 + \frac{1}{3 + \frac{1}{3 + 1}}}$$

(A) $\frac{43}{13}$ (B) $\frac{4}{13}$ (C) $\frac{43}{142}$ (D) $\frac{13}{4}$ (E) $\frac{13}{43}$

- 8) What is the largest prime number that is a divisor (factor) of P, where

$$P = 13 \times 17 + 19 \times 23?$$

(A) 2 (B) 7 (C) 17 (D) 19 (E) 47

- 9) John's five day schedule continually repeats itself. It calls for him to work 4 days and then take the 5th day off.
What is the greatest number of days that John can have off in any one month?

(A) 3 (B) 4 (C) 5 (D) 6 (E) 7

- 10) The price of a bar of chocolate has increased by 20%. How many bars can now be purchased for the amount of money that used to buy 42 bars?

(A) 34 (B) 35 (C) 36 (D) 37 (E) 42

Section C (8 Marks)

- 11) Four soccer teams played each other four times in a season of competition. Each winning team was awarded 3 points. Teams that had a draw were awarded 1 point each, and a losing team were awarded no points. At the end of the season Team A had 21 points, Team B had 17 points, Team C were on 16 points and Team D were on 12 points. How many games ended in a draw?

(A) 3 (B) 4 (C) 5 (D) 6 (E) 7

- 12) John leaves school every day at the same time and cycles home. If he cycles at 20 km/h, he arrives at 4.30 p.m. If he cycles at 10 km/h he arrives at 5.15 p.m. At what speed, in km/h, must he cycle to arrive home at 5 pm?

(A) 12 (B) $13\frac{1}{3}$ (C) 15 (D) $16\frac{2}{3}$ (E) $17\frac{2}{3}$

- 13) A group of students decided to buy a present for their friend's birthday. If they collect €10 from everybody, they will be short €10. If they collect €12 each, they will have €20 more than they need. How much did the toy cost?

(A) €10 (B) €12 (C) €20 (D) €160 (E) €180

- 14) Fresh peaches have a moisture content of 80%. When left in the sun to dry, they lose 75% of their moisture content. What is the moisture content of dried peaches?

(A) 5% (B) 24% (C) 30% (D) 45% (E) 50%

- 15) A number is a palindrome if it read the same backwards as forwards. For example, 464 is a palindrome. How many numbers between 100 and 300 are palindromes?

(A) 10 (B) 20 (C) 25 (D) 30 (E) 35



Comórtas Sóisearach Matamaitice Éireann
(Irish Junior Mathematics Competition) 2016

ANSWER KEY

SECTION A

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

SECTION B

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

SECTION C

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

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Instructions

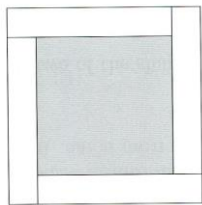
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Section A (5 marks)

- 1) A furniture shop had a special offer; if a customer bought three chairs he would get a fourth for €3. Jack bought a set of four chairs and paid €240. What was the regular price of one chair?

- (A) €60 (B) €79 (C) €80 (D) €90 (E) €120
- 2) In a large port there are 12500 containers, which, if placed end to end, would stretch to about 75 km.
On average, what is the length of one container?
- (A) 6m (B) 16m (C) 60m (D) 160m (E) 600m
- 3) The chairs in a room are numbered 26 to 100. How many such chairs are there?
- (A) 24 (B) 25 (C) 74 (D) 75 (E) 76
- 4) Given that $\frac{1001}{77} = 13$, what is the value of $\frac{100.1}{770}$?
- (A) 0.13 (B) 1.3 (C) 13 (D) 130 (E) 1300
- 5) What is a half of 1%, written as a decimal?
- (A) 0.0005 (B) 0.005 (C) 0.02 (D) 0.05 (E) 0.2
- 6) A taxi ride costs €5.80 plus €1.25 for each kilometre travelled.
How much would a taxi ride of 7 kilometres cost?
- (A) €13.55 (B) €13.85 (C) 13.95 (D) €14.55 (E) €14.65
- 7) A barrel is one third full of water. When four litres of water are added, the barrel is half full. What is the capacity of the barrel in litres?
- (A) 8 (B) 12 (C) 20 (D) 24 (E) 48
- 8) The value of $19 \times 11 + 13 \times 19 - 19 \times 14$ is
- (A) 182 (B) 184 (C) 186 (D) 188 (E) 190
- 9) In simplest form, the fraction $\frac{60}{x}$ represents a whole number.
x is also a whole number.
What is the total number of values that x can be?
- (A) 8 (B) 9 (C) 10 (D) 11 (E) 12
- 10) Choose any number between 32 and 56. Add 20. Subtract 17. Add 13. Subtract your original number.
What is the resulting number?
- (A) 12 (B) 14 (C) 16 (D) 18 (E) 20

Section B (6 Marks)

- 11) Jack is short 51 cents to buy a drink, while Pat is short 45 cents. Together they could buy one drink and get 2 cents change. How much money does Pat have?
- (A) 47 (B) 48 (C) 53 (D) 96 (E) 98
- 12) There are some sweets in a jar. John took half the sweets. Then Jackie took half of the sweets left in the jar. Later, Sinéad took half the remaining sweets. In the end there were 6 sweets in the jar. How many sweets were in the jar at the beginning?
- (A) 12 (B) 18 (C) 20 (D) 24 (E) 48
- 13) For nonzero real numbers $\frac{\frac{1}{a} + \frac{1}{b}}{\frac{1}{a} - \frac{1}{b}} = 2016$
- The value of $\frac{a+b}{a-b}$ is
- (A) 0 (B) $-\frac{1}{2016}$ (C) $\frac{1}{2016}$ (D) -2016 (E) 2016
- 14) Four rectangles, each 100 cm long and 20 cm wide, are arranged around a square without overlapping, as shown in diagram. How long, in cms, is the side of the shaded middle square?
- 
- (A) 60 (B) 80 (C) 90 (D) 100 (E) 120
- 15) A certain paint colour is made by mixing 2 parts yellow, 5 parts red and 1 part black. If a batch of paint was made using 3 litres of yellow, how many litres of paint would be in the whole batch?
- (A) 6 (B) 8 (C) 9 (D) 10 (E) 12
- 16) A two-digit number has tens and units. For example 34 is a two-digit number. A two digit number **ab** has the property that $a^2 + b^2 = 65$. How many such numbers are there?

- (A) 1 (B) 2 (C) 3 (D) 4 (E) 5
- 17) 1, 2, 3, 4,..... are consecutive whole numbers.
Pat writes down five consecutive whole numbers. If the sum of the three smallest numbers is 60, what is the sum of the largest three numbers?
- (A) 62 (B) 63 (C) 64 (D) 65 (E) 66
- 18) If $\frac{1}{x+3} = 4$, then $\frac{1}{x+4}$ is equal to
- (A) 3 (B) $\frac{4}{5}$ (C) $\frac{5}{4}$ (D) 2 (E) $\frac{4}{3}$
- 19) The floor of a rectangular room is completely covered with square tiles.
The room is 9 tiles long and 5 tiles wide.
Find the number of tiles that touch the walls or doors of the room.
- (A) 22 (B) 24 (C) 26 (D) 28 (E) 45
- 20) When I open a book I see two pages. The sum of the page numbers is 245.
What is the number of the next page?
- (A) 122 (B) 123 (C) 124 (D) 125 (E) 126

Section C (8 Marks)

- 21) Ten posts are placed 6 metres apart in a straight line. A fence goes from the first post to the last post. If we ignore the thickness of the posts, how many metres long is the fence?
- (A) 48 (B) 52 (C) 54 (D) 60 (E) 64
- 22) The pages of a book are numbered consecutively, beginning with 1. The digit 7 is printed 25 times in numbering the pages.
What is the largest number of pages the book can have?
- (A) 147 (B) 154 (C) 155 (D) 156 (E) 157
- 23) Five children sit around a circular table. Their chairs are numbered in order from 1 to 5. Aaron sits next to both Bob and Conor. Denise sits next to both Bob and Eileen.
The numbers on Aaron's and Conor's chairs add up to 6.

Who sits on chair number 3?

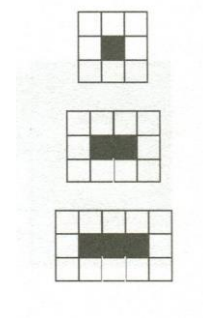
- (A) Aaron (B) Bob (C) Conor (D) Denise (E) Eileen

24) a, b and c are whole numbers so that $a + \frac{1}{b + \frac{1}{c}} = \frac{45}{7}$

Find the value of $a + b + c$

- (A) 2 (B) 3 (C) 5 (D) 9 (E) 11

- 25) Each figure shown is formed by surrounding one row of black squares with white squares.
How many white squares will surround one row of 50 black squares?



- (A) 100 (B) 102 (C) 104 (D) 106 (E) 108

I.M.T.A. (Cork Branch)



Comórtas Sóisearach Matamaitice Éireann (Irish Junior Mathematics Competition) 2016

ANSWER KEY (Final)

SECTION A

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

SECTION B

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

SECTION C

21. C
22. D
23. D
24. E
25. D

