



## LOGIC QUANTITATIVE TEST

<b>FAMILY NAME:</b>	<b>GIVEN NAME:</b>
<b>DATE OF BIRTH:</b>	<b>ID TYPE AND NUMBER:</b>

**CHECK / THE CORRECT ANSWER.**

1) If an item is sold today at the price of € 15.25 and the same item was sold a year ago at € 14.10, what is the percentage price increase?

<input type="checkbox"/> 8%	<input type="checkbox"/> 20%	<input type="checkbox"/> about 8.16%	<input type="checkbox"/> about 10.09%	<input type="checkbox"/> exactly 10.09%
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2) How many three-digit numbers (between 000 ad 999) are there whose digits are in a strictly increasing order?

<input type="checkbox"/> 60	<input type="checkbox"/> 80	<input type="checkbox"/> 100	<input type="checkbox"/> 120	<input type="checkbox"/> 720
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3) If we divide 351 by 12 we obtain a quotient  $q$  and a remainder  $r$ ; how much is  $q - r$  ?

<input type="checkbox"/> 26	<input type="checkbox"/> 28	<input type="checkbox"/> 30	<input type="checkbox"/> 36	<input type="checkbox"/> 38
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4) Mary goes out shopping with a set amount of money (€). In the first shop she spends  $\frac{1}{3}$  of the amount and in the second she spends  $\frac{2}{5}$  of the remaining sum. She comes back home with € 36. How much has she spent all together?

<input type="checkbox"/> 36	<input type="checkbox"/> 54	<input type="checkbox"/> 60	<input type="checkbox"/> 85	<input type="checkbox"/> 90
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5) Calculate:  $(10^{-2} + 10^{-4} + 10^{-6} + 10^{-8}) / (10^{-1} + 10^{-3} + 10^{-5} + 10^{-7})$ . What is the result?

<input type="checkbox"/> 1/100	<input type="checkbox"/> 1/10	<input type="checkbox"/> 4/10	<input type="checkbox"/> 1	<input type="checkbox"/> 10
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6) The product of two natural numbers is 210 and their sum is the least possible one. How much is this sum?

<input type="checkbox"/> 21	<input type="checkbox"/> 41	<input type="checkbox"/> 31	<input type="checkbox"/> 17	<input type="checkbox"/> 29
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7) An admission test consists of 25 questions. The scoring criteria is: 4 points for each correct answer; - 2 for no answer or a wrong answer. The minimum pass is 60 points. What is the minimum number of correct answers needed to be admitted?

<input type="checkbox"/> 16	<input type="checkbox"/> 17.3	<input type="checkbox"/> 18	<input type="checkbox"/> 18.3	<input type="checkbox"/> 19
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8) An invoice is drawn for a total amount of € 820.00 (21%VAT included). What is the amount before tax (rounded to the nearest cent.)?

<input type="checkbox"/> 647.80	<input type="checkbox"/> 649.26	<input type="checkbox"/> 699.00	<input type="checkbox"/> 677.69	<input type="checkbox"/> 820.00
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9) Given a cube and a sphere circumscribing it, what is the ratio of the volume of the sphere to that of the cube?

<input type="checkbox"/> $\pi/2$	<input type="checkbox"/> $\frac{1}{2}\sqrt{3}$	<input type="checkbox"/> $\frac{2\pi}{\sqrt{3}}$	<input type="checkbox"/> $\frac{1}{2}\sqrt{3}\pi$	<input type="checkbox"/> none of the previous answers
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10) Consider the following system of equations with  $x, y, z$  unknown integers:  
 $x + y + z = -1$  and  $-x + y - z = 3$ . Find the value of  $y$  on condition that none of the numbers be 0, that all three be different from each other, and that  $|xyz|$  be minimal

<input type="checkbox"/> -2	<input type="checkbox"/> -1	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2
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11) If I invest a capital amount  $C$  at a yearly compound interest rate of 4%, after 3 years I will have an amount  $M$ . What is the profit  $M - C$  if the capital invested is of € 11,000.00 (rounded to the nearest Euro)?

- |                                |                                |                                |                                |   |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|---|
| <input type="checkbox"/> 1,320 | <input type="checkbox"/> 1,366 | <input type="checkbox"/> 1,374 | <input type="checkbox"/> 1,400 | <input type="checkbox"/> none of the previous answers |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|---|

12) A wooden cube of side 10 cm is totally immersed in water. After some time it is taken out. Owing to water absorption each side has increased 5% in length. How much water has the cube absorbed (expressed in centilitres) ?

- |                                    |  |                                  |                              |                             |
|------------------------------------|--|----------------------------------|------------------------------|-----------------------------|
| <input type="checkbox"/> almost 16 | <input type="checkbox"/> little less than 20 | <input type="checkbox"/> about 1 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 15 |
|------------------------------------|--|----------------------------------|------------------------------|-----------------------------|

13) Given the polynomial  $x^5 - 2x^3 - x^2 + 2$ , how many distinct roots does the polynomial have?

- |                            |                            |                            |                            |                            |
|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 5 |
|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|

14) 5 boxes each hold 6 coloured marbles. In each box at least three marbles have the same colour. We can indisputably deduce that:

- |   |   |  |   |   |
|---|---|--|---|---|
| <input type="checkbox"/> If a box contains one yellow marble, it contains at least two more yellow ones | <input type="checkbox"/> There are at least 15 marbles of the same colour | <input type="checkbox"/> For each colour there is at least one box with three marbles of that colour | <input type="checkbox"/> For each box there is at least one colour which appears at least three times | <input type="checkbox"/> For each box there is only one colour which appears at least three times |
|---|---|--|---|---|

15) If the inflation rate of a currency  $C$ , from January 1st 2009 to January 1st 2012, were a yearly 6%, what would be the equivalent of 1,000  $C$  on January 1st 2012 evaluated on January 1st 2009 (rounded to the nearest cent)?

- |                                 |                                 |                                   |                                 |                                 |
|---------------------------------|---------------------------------|-----------------------------------|---------------------------------|---------------------------------|
| <input type="checkbox"/> 839.63 | <input type="checkbox"/> 840.27 | <input type="checkbox"/> 1,060.00 | <input type="checkbox"/> 882.00 | <input type="checkbox"/> 847.46 |
|---------------------------------|---------------------------------|-----------------------------------|---------------------------------|---------------------------------|

16) Consider a block of shares whose initial value is € 1,000. The first day these shares gain 3%. The second day the new value loses 5%. The third day this last value decreases by 2%. On the fourth day the entire sum gains 4%. What is the final value of those shares (rounded to the nearest cent)?

- |                                 |                                 |                                 |                                   |                                   |
|---------------------------------|---------------------------------|---------------------------------|-----------------------------------|-----------------------------------|
| <input type="checkbox"/> 995.00 | <input type="checkbox"/> 997.29 | <input type="checkbox"/> 998.21 | <input type="checkbox"/> 1,000.00 | <input type="checkbox"/> 1,001.12 |
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Scoring criteria: points

1 for each correct answer ;

0 for no answer or more than one answer to the same question;

- 0.25 for each wrong answer.

Minimum pass: 5 points.

Trieste, 2012 September 12