INSTRUCTIONS TO CANDIDATES

- Answer all questions. There are 20 questions to answer.

- Each question carries 1 mark.

- Calculators, protractors and other mathematical instruments are not allowed.

- You are not required to show your working. However space for working is provided if you need it.
<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Space for Working</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Work out. (4^2 - 2^4 = ) __________</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Write down the <strong>two prime numbers</strong> between 30 and 40. ______________</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><strong>Subtract</strong> 499 from 1000. ______________</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>If the first of January is a Thursday, what day will the first of February be? ______________</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Work out the number of <strong>minutes</strong> in one day. __________ minutes</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>An aeroplane leaves Malta International Airport at quarter to nine and arrives at Gatwick airport at 11.35 (Malta time). How long does the flight take? _____ hours _____ minutes</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>A train travels at a speed of 120 km/h. How long does it take the train to travel 480 km? _____ hours _____ minutes</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>The mean of two numbers is 21. The range is 6. Work out the value of the <strong>larger</strong> number. __________</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Question</td>
<td>Space for Working</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>9</td>
<td>Write down the <strong>largest</strong> possible <strong>even</strong> number using each of the digits 8, 3, 2 and 1 only once.</td>
<td></td>
</tr>
</tbody>
</table>
| 10  | Work out the value of  
\[ 2^3 \times \sqrt{\frac{1}{4}} \] |                   |
| 11  | What is the value of \( \sqrt{p^2 - q^2} \), given that \( p = -10 \) and \( q = 8 \)? |                   |
| 12  | \( a \) and \( b \) are **two different fractions**. Write two possible values of \( a \) and \( b \) such that  
\[ a + b = 1 \]  
\( a = \_\_\_, b = \_\_\_ \) |                   |
<p>| 13  | Work out [ 60 \times 7.28 + 40 \times 7.28 ] |                   |
| 14  | The distance of the earth from the sun is ( 1.488 \times 10^{11} ) metres. Change this distance to <strong>kilometres</strong>. Give your answer in <strong>standard form</strong>. |                   |
| 15  | Work out the <strong>difference</strong> between 10% of €143 and 10% of €93. |                   |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Space for Working</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Write down the next number.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, \ldots]</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Write down one possible value of (x), given that (3x^2 = 48)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(x = \ldots)</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>The sides of a rectangle are 8 cm and 6 cm long. Work out the length of a diagonal of the rectangle.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(\ldots) cm</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>A pool is filled at the rate of 18 litres per minute. Write this rate in millilitres per second.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(\ldots) ml/s</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>3 burgers and 7 drinks cost €13.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 burgers and 4 drinks cost €9.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What is the total cost of 1 burger and 1 drink?</td>
<td>€(\ldots)</td>
</tr>
</tbody>
</table>
1 Mr and Ms Borg are buying a washing machine during a sale. 

Work out the **percentage reduction**.

Percentage reduction = __________%  

2 These four numbers are written in **standard form**.

\[ 7.6 \times 10^3 \quad 1.57 \times 10^6 \quad 9.8 \times 10^{-3} \quad 4.9 \times 10^{-2} \]

(i) Write down the **largest** number. ____________________

(ii) Write down the **smallest** number. ____________________

(iii) Write \(4.9 \times 10^{-2}\) as an **ordinary number**. ____________________

(iv) **Multiply** \(7.6 \times 10^3\) by \(1.57 \times 10^6\). Give your answer in **standard form**.

________________________
3  (i) Two triangles are **congruent**. **Underline** the statement that is **true**.
   A. The areas of the two triangles are **always** equal.
   B. The areas of the two triangles are **sometimes** equal.
   C. The areas of the two triangles are **never** equal.

   (ii) In the diagram the straight lines PRT and QRS intersect at R. PQ is **parallel** and **equal** to ST. Prove that triangles PQR and TSR are congruent.

4  The heights of six boys are 1.53 m, 1.49 m, 1.60 m, 1.65 m, 1.90 m and 1.43 m.

   (i) Work out the **mean** height of the six boys.

   \[
   \text{Mean} = \frac{1.53 + 1.49 + 1.60 + 1.65 + 1.90 + 1.43}{6} \text{ metres}
   \]

   (ii) Five other boys join the six boys to form a football team. The mean of these five boys is 1.55 m. Work out the **mean** of the eleven boys.
   Give your answer correct to **2 decimal places**.

   \[
   \text{Mean} = \frac{1.53 + 1.49 + 1.60 + 1.65 + 1.90 + 1.43 + 1.55 \times 5}{11} \text{ metres}
   \]
5  (i) The angles of a triangle are \(x^\circ\), \(y^\circ\) and \(z^\circ\). Write a formula for \(x\) in terms of \(y\) and \(z\).

\[ x = \text{___________________________} \]

(ii) The formula

\[ c = \sqrt{a^2 + b^2} \]

is used to find the length of the hypotenuse, \(c\), in a right-angled triangle.

(a) Work out the value of \(c\) when \(a = 12\) cm and \(b = 35\) cm.

\[ c = \text{___________} \text{ cm} \]

b) Make \(a\) the subject of the formula.

\[ a = \text{__________________} \]

5 marks
6 A surveyor is 125 metres from the foot of a building. He measures the angle of elevation of the top of the building as 15°. The sighting device is 1.8 metres above the ground.

(i) Work out the **height** of the building, correct to **1 decimal place**.

\[
\text{height} = \underline{\phantom{0}} \text{ metres}
\]

(ii) The surveyor moves 30 metres closer to the building. Work out the new **angle of elevation**, correct to the **nearest degree**.

\[
\text{Angle of elevation} = \underline{\phantom{0}} ^\circ
\]
7 (i) Solve the simultaneous equations \[ \begin{align*} 3x + 2y &= 12 \\ 4x - y &= 5 \end{align*} \]

\[ x = _____, \ y = _____ \]

(ii) The equations of two straight lines are \[ 3x + 2y = 12 \text{ and } y = 4x - 5 \]. Write down the coordinates of the point of intersection of the two lines.

\[ (\ ,\ ) \]

5 marks

8 In 2005, 9600 people voted in the election for Ħal Melħ Local Council. Mr Borg obtained 3456 votes, Ms Sammut obtained 39\% of the votes and Ms Vella obtained a quarter of the votes.

(i) What percentage of the votes did Mr Borg get?

\[ \text{_______\%} \]

(ii) The mayor is the candidate with the highest number of votes. Who was elected mayor of Ħal Melħ and how many votes did the candidate obtain?

\[ \text{_______ mayor} \quad \text{_______ votes} \]
8 (iii) In 2008, Mr Borg increased the number of votes by 12.5%. Work out the number of votes obtained by Mr Borg in 2008.

__________ votes

6 marks

9 (i) Work out the values of \( w \) and \( x \).

\[ w = \quad \text{,} \quad x = \quad \text{.} \]

(ii) Work out the value of \( y \).

\[ y = \quad \text{.} \]

(iii) Work out the value of \( z \).

\[ z = \quad \text{.} \]

8 marks
A firm making calculators exports its products to four countries. The pie chart shows the exports in 2010.

(i) What percentage of the calculators was exported to the United Kingdom?

_________%

(ii) What fraction of the calculators was exported to Germany?

_________

(iii) The firm exported 13 725 calculators to Germany. Work out the total number of calculators exported by the firm.

_________ calculators

The table below shows the exports of the firm in 2011, totalling 53800 calculators.

<table>
<thead>
<tr>
<th>Country</th>
<th>United Kingdom</th>
<th>Italy</th>
<th>Germany</th>
<th>Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>45</td>
<td>10</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>

(iv) On the grid below draw a bar chart to illustrate this data.

(v) Was there an increase or decrease in the exports to Spain from 2010 to 2011? Give a reason for your answer.

_________________________________________________________________

8 marks
The diameter of a circular pond is 8 metres. The pond is surrounded by a path of width 1.5 metres.

Work out, correct to 2 decimal places

(i) the **area** of the pond

\[
\text{Area of pond} = \text{__________ m}^2
\]

(ii) the **area** of the path

\[
\text{Area of path} = \text{__________ m}^2
\]

The path is to be surfaced with turf which is bought in bags each covering 7 m\(^2\).

(iii) How many **bags** are required?

\[
\text{__________ bags}
\]

8 marks
State whether these statements are TRUE or FALSE. Give reasons for your answers.

(i) A triangle can have two obtuse angles.

(ii) If two rectangles both have an area of 24 cm\(^2\), they must also have the same perimeter.

(iii) A rhombus is a parallelogram.

(iv) Cutting a parallelogram along the diagonal produces two congruent triangles.

8 marks
ABC HARDWARE hires a concrete mixer. The graph below shows the cost, $C$, charged for hiring the concrete mixer for $n$ days.

\begin{itemize}
  
  \item[(i)] Work out the cost of hiring a concrete mixer for 3 days.
  \[Cost = \€__________\]

  \item[(ii)] Write down the equation of the straight line.
  \[C = \____________\]

The cost of hiring a concrete mixer from XYZ HARDWARE is given by a fixed charge of €20, and €10 for each day for which it is hired.

\item[(iii)] Work out the total cost of hiring the mixer for 5 days.

\[Total\ cost = \€\__________\]
13 (iv) Complete the table to show the cost of hiring the mixer from XYZ HARDWARE.

<table>
<thead>
<tr>
<th>Number of Days, ( n )</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost, €C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(v) On the grid (page 10) draw a graph to represent this data.

(vi) Write down the equation of the line passing through these points.

\[ C = \phantom{000000} \]

(vii) Karmenu wants to hire a concrete mixer for 4 days. Which hardware store gives him the best deal? Give a reason for your answer.

_________________________________________________________________

_________________________________________________________________

10 marks

END OF PAPER