INSTRUCTIONS TO CANDIDATES

1. Write your name, examination number and school/centre in the spaces provided on the question paper.
2. There are eight (8) questions in this paper. Answer any five (5) questions.
3. Answer all questions in the spaces provided on the question paper.
4. Write down your answers clearly.
5. All essential working must be shown. Candidates will be penalized for omitting essential working.
6. Cell phones and calculators are not allowed in the examination room.
7. Tick (√) the question you have attempted in the grid provided below.

<table>
<thead>
<tr>
<th>Questions</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>Total marks</th>
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<tbody>
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<td>Tick</td>
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This question paper consists of 14 pages.
1 (a) Find $1022_{\text{five}} - 212_{\text{five}}$, giving your answer in base ten. [2]

(b) Evaluate $\frac{2}{3} \div \left(1 + \frac{2}{3}\right)$. [3]

(c) Mrs Kaloba invested K900 000 in a bank for 3 years at 12% per annum. Calculate the interest she got after 3 years. [2]
(d) The distance-time graph below shows the journey of Mr Bulendo travelling from Solwezi to his home, 120km away.

![Distance-Time Graph]

Calculate

(i) Mr Bulendo’s speed during the first hour,

(ii) the average speed for the whole journey.

[Total: 10]
2. (a) Simplify $2(y - 3) - 3(2 - y)$. [2]

(b) Express $\frac{p + 1}{2} + \frac{p}{3}$ as a single fraction in its simplest form. [3]

(c) In the diagram below, QRS is a straight line, PR = RS, angle QRP = 50°, angle RSP = 25° and PQ = QR.

\[
\begin{array}{c}
P \\
\nearrow \\
Q \rightarrow R \rightarrow S \\
\searrow \\
\end{array}
\]

Calculate

(i) angle QPR, [1]

(ii) angle PRS. [1]
(d) In a class of 50 pupils, 28 pupils like guava drink, 30 like apple drink and 10 like both.

(i) Illustrate this information in a Venn diagram.

(ii) How many pupils do not like either of the drinks?

3 (a) The size of an exterior angle of a regular polygon is $45^\circ$.

(i) Find the number of sides of this polygon.

(ii) Calculate the sum of interior angles of this polygon.
(b) Factorise \(4h^2 - 12gh\). [2]

(c) Solve the simultaneous equations
\[
\begin{align*}
x + y &= 1, \\
3x - y &= 7.
\end{align*}
\] [3]

(d) Find the value of \(1.3 - 0.2 \times 1.5\). [2]
(a) Solve the inequation $x - 3(x - 2) \geq 2$.  

(b) (i) Use geometrical instruments to construct a triangle ABC with $AB = 7.5\text{cm}$, $BC = 9\text{cm}$ and $AC = 8\text{cm}$.  

(ii) Construct the bisectors of $AB$ and $BC$, let the bisectors meet at $O$.  

(iii) Taking $OA$ as radius with centre $O$, construct a circle.
(c) Mrs Gangu needs 4 people to do a piece of work in 12 days. How many people would she need to do the same work in 8 days? [3]
(a) Given that \( mq = 4m + 3r \), make \( m \) the subject of the formula. [3]

(b) Mr Amarenti, who owns a house valued at K36 000 000, wants to charge rent at 20% per annum of the value of the house. What monthly rent must he charge? [3]

(c) The figure below shows a sideview of a block of wood at Mr Timba’s workshop. The semi-circular part ABE is removed. BC = 10cm and DC = 14cm. (Use \( \pi = \frac{22}{7} \))

(i) Calculate the radius of the semi-circle ABE. [1]
(ii) Calculate the area of the shaded part.  [3]

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**Total: 10**

6  (a) The table below shows the number of hectares for different crops grown by Mr Izyakulya.

<table>
<thead>
<tr>
<th>Name of crop</th>
<th>Maize</th>
<th>Sorghum</th>
<th>Millet</th>
<th>Rice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of hectares</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

(i) What fraction of the total number of hectares is Sorghum?  [1]

(ii) Use the information in the table above to complete the bar chart below.  [4]
(b) Solve the equation $3(y - 2) = 4(9 - y)$.

(c) A mapping from P to Q is such that $x \rightarrow \frac{x}{3}$. Find the values of a and b in the arrow diagram below.
7  (a) Four orphans received help from Lugwasho Masiye Organisation for their education in the ratio 2:4:6:8. If the biggest amount was K2 400 000, calculate the total amount contributed by the organization. [3]

(b) Calculate \(32_{\text{five}} \times 14_{\text{five}}\) giving your answer in base five. [2]

(c) The figure below shows a semi-circle with diameter 14x cm.

![Diagram of a semi-circle with diameter 14x cm.]

Taking \(\pi\) to be \(\frac{22}{7}\), express the area of the semi-circle in terms of x, giving your answer in its simplest form. [2]
(d) The triangles PQR and STV are similar. Angle PQR = angle STV, angle RPQ = angle VST and angle QRP = angle TVS.

Find the value of $x$. [3]

Total: [10]
8. (a) Add $1101_{\text{two}}$ to $1111_{\text{two}}$ and give your answer in base ten. [3]

(b) Calculate the exact value of $88 \div 0.44 \times 25$. [2]

(c) In the XOY plane below, the points P, Q and R are ($-4$, $-2$), ($-2$, $4$) and ($4$, $6$), respectively. The three points P, Q and R are part of a rhombus PQRS.

(i) Complete the rhombus by plotting the fourth point S. [1]

(ii) Write the coordinates of point S. [2]

(iii) Draw the lines of symmetry in this rhombus. [2]

Total: [10]