EXAMINATIONS COUNCIL OF ZAMBIA
JUNIOR SECONDARY SCHOOL LEAVING EXAMINATION (GRADE 9) 2016

Mathematics 401/2
Paper 2

(INTERNAL AND EXTERNAL CANDIDATES)

READING TIME: 10 MINUTES
WORKING TIME: 2 HOURS

CANDIDATE NAME: ..................................................................................
EXAMINATION NUMBER: ......................................................................
SCHOOL/CENTRE: ..................................................................................

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 your answers clearly.

5 All essential working must be shown. Candidates will be penalized for omitting essential working.

6 Tick (✓) the question you have attempted in the grid provided below.

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<tr>
<th>Questions</th>
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Information for candidates

Cell phones and calculators are not allowed in the examination room.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

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This question paper consists of 14 printed pages.
(a) Solve the equation \( x - 8 = 3(4 - x) \). [2]

(b) Write 0.03568 in standard form correct to 2 significant figures. [2]

(c) Express \( \begin{pmatrix} 5 & 3 \\ -4 & 2 \end{pmatrix} - 2 \begin{pmatrix} 2 & 2 \\ 3 & 3 \end{pmatrix} \) as a single matrix. [3]
(d) Mr. Matanki bought a cylindrical tank to store drinking water. The tank has a height of 70cm and a radius of 20cm. Calculate its volume.

(Take $\pi = \frac{22}{7}$).

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2 (a) Given that $E = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, $A = \{1, 2, 4, 5\}$, $B = \{2, 4, 6, 7\}$ and $C = \{2, 3, 5, 7, 8\}$,

(i) illustrate this information in the Venn diagram below,

![Venn diagram](image)

(ii) list the elements of the set $(A \cup B)' \cap C$.

---

[Total: 10]
(b) Solve the simultaneous equations
\[ 2x - y = 5, \]
\[ x + y = 4. \]  

(c) Solve the inequation \[ 2(x - 1) > 3x - 5. \]  

[Total: 10]
3 (a) Find the product of $432_{\text{five}}$ and $23_{\text{five}}$, giving your answer in base five. [3]

(b) Given that $x = \frac{w + 3}{2 - w}$, make $w$ the subject of the formula. [3]
(c) On the grid provided below,

(i) plot the points V(−5, −5), W(−5, 1), X(−2, 3), Y(1, 1) and Z(1, −5), [2]

(ii) join the points to form a polygon VWXYZ, [1]

(iii) draw the line $x = −2$. [1]

[Total: 10]

4 (a) Simplify $2x + 3(x - 4) - 4x$. [2]
(b) The angles of a quadrilateral are $3y^\circ$, $(2y + 10)^\circ$, $4y^\circ$ and $y^\circ$. Find the value of $y$. [2]

(c) A marketer made K200.00 profit from *Kalembula*, K150.00 profit from *Chibwabwa* and K250.00 profit from tomatoes. Illustrate this information on the pie chart below. [3]
(d) Given that the base of a triangle is $b$ and its perpendicular height is $h$, complete the flow chart below, which is for calculating and displaying its area $A$. [3]

5 (a) A bag contains 15 white and 9 green balls. If a ball is picked at random from the bag, find the probability that it is green. [2]
(b) A company salesman is paid a salary of K2 000.00 per month. He also receives a commission of 2% of the value of the goods sold. Calculate his total income if he sold goods worth K25 000.00. [3]

(e) (i) Construct triangle ABC in which AB = 4cm, BC = 5cm and AC = 6cm. [1]
(ii) Bisect the sides AB and AC and let them meet at O. [2]
(iii) With centre O and radius OA, draw a circle. [2]

[Total: 10]
6 (a) The arrow diagram below represents a relation from set A to set B.

\[
\begin{array}{c|c}
A & B \\
\hline
2 & 0 \\
3 & 1 \\
4 & 2 \\
\end{array}
\]

(i) If \( x \in A \) and \( y \in B \), write the formula for the relation. [2]

(ii) Find the value of \( x \) when \( y = -1 \). [2]

(b) In the diagram below, triangles LMN and LPQ are similar.

\[
\begin{array}{c}
L \\
\hline
Q \\
\hline
M \\
\hline
N
\end{array}
\]

Given that \( LP = 6 \text{ cm} \), \( PM = 3 \text{ cm} \), \( PQ = 4 \text{ cm} \) and \( NQ = 2 \text{ cm} \), calculate the length of \( LQ \). [3]
(c) The bar chart below shows the number of goals scored by a football team.

(i) How many games did the team play? [2]

(ii) Complete the frequency table below. [1]

<table>
<thead>
<tr>
<th>Number of goals</th>
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<tr>
<td>Number of games</td>
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</table>
7 (a) Find the value of $1100_{two} + 100_{two}$, giving your answer in base two. [2]

(b) The diagram below shows a wooden triangular prism $PQRSTU$.

![Diagram of a triangular prism]

Given that $PQR = STU = 90^\circ$, $PR = 10\text{cm}$, $PQ = 6\text{cm}$, $QR = 8\text{cm}$ and $RU = 12\text{cm}$, calculate the total surface area of the prism $PQRSTU$. [3]
(c) Landila gets an annual salary of K24 480.00. What is his monthly gross salary if his housing allowance is K400.00? [2]

(d) Chiti is preparing to go to London. He has K19 600.00 to convert to British pounds. How much will he get if the exchange rate is £1 = K9.80? [3]

[Total: 10]
8  (a) The sum of interior angles of a regular polygon is $1080^\circ$.
   Calculate the size of each interior angle. \[3\]

   (b) A freezer costing K4 000.00 is depreciated using the straight line
   method at 5% per year. Find its book value after 4 years. \[3\]

   (c) Hanchito’s wage for a 5 day working week is K360.00. Given that he
   works 8 hours per day, calculate

   (i) his wage per year if there are 52 weeks in a year, \[2\]

   (ii) his rate per hour. \[2\]

   [Total: 10]
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