EXAMINATIONS COUNCIL OF ZAMBIA

JUNIOR SECONDARY SCHOOL LEAVING EXAMINATION (GRADE 9) -- 2014

MATHMATICS 401/2
PAPER 2
(SPECIMEN)

(INERNAL AND EXTERNAL CANDIDATES)

READING TIME: 10 MINUTES
WORKING TIME: 2 HOURS
MARKS: 50

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.

<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>
</tr>
</thead>
<tbody>
<tr>
<td>Tick</td>
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<td>Mark</td>
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</tr>
</tbody>
</table>

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 13 pages.
1  (a) Write 5660 in standard form correct to 1 decimal place. [2]

(b) Solve the equation $4(x - 1) - 3(x - 2) = 6$. [2]

(c) Given that $y = \frac{2x + 5}{9}$, make $x$ the subject of the formula. [3]

(d) The cost of a dining table is K468.00 and it includes Value Added Tax (VAT) at 17%. Calculate the price of the dining table before VAT is added. [3]

[Total: 10]
2 (a) A box contains 6 blue pencils and 5 red pencils. If one pencil is picked at random from the box, find the probability that it is blue.

(b) Express \( \begin{pmatrix} 3 & 4 \\ 2 & 5 \end{pmatrix} \) as a single matrix.

(c) Solve the simultaneous equations
\[
\begin{align*}
2x - y &= 6, \\
2x - 2y &= 2.
\end{align*}
\]
(d) On the XOY-plane below,

(i) plot the point P(-1, 3),

(ii) draw the graph of \( y = x \).

[Total: 10]

3 (a) It is given that \( E = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11\} \), \( A = \{2, 3, 4, 5, 6\} \), \( B = \{2, 5, 7, 11\} \) and \( C = \{2, 4, 6, 8, 10\} \).

(i) Illustrate this information in the Venn diagram below.

(ii) List the members of \( (A \cap B) \cup C \).
(b) Illustrate the solution of \( x + y \geq 4 \) on the XOY - plane below by shading the wanted region for values of \( x \) from 0 to 5.

(c) The triangles below are similar.

Given that \( PR = 8 \text{ cm}, PQ = 16 \text{ cm}, XZ = 4 \text{ cm} \) and angle \( QPR = \text{angle YXZ} = 50^\circ \), calculate the length of \( XY \).
4 (a) Calculate $14_{\text{five}} \times 12_{\text{five}}$, giving your answer in base five.

(b) (i) Use geometrical instruments to construct triangle PQR in which PQ = 11cm, angle PQR = $117^0$ and QR = 6.5cm.
(ii) Measure and write the length of PR.
(iii) Construct the perpendicular bisector of PQ.
(iv) Bisect angle PRQ.
(c) Find the sum of interior angles of a polygon with 6 sides. [2]

(d) Given the following set of ordered pairs (1, 2), (2, 4) (3, 6), (4, 8) and (5, 10), find the function representing this relationship. [2]

5 (a) Evaluate $1010_{\text{two}} \div 10_{\text{two}}$, giving your answer in base two. [2]
(b) The diagram below shows a solid cylinder of diameter 10cm and height 20cm.

\[ \text{Taking } \pi = 3.14, \text{ calculate its curved surface area.} \] [2]

(c) Kafola has a monthly salary of K3 500.00. His tax free allowance is K3 000.00 and he pays income tax at the rate of 25% on the balance of his salary.
What is his net salary? [3]
(d) The ages of girls who took part in a football game were recorded as follows:

14 16 16 16 14 17 15 13 13 14 16

13 16 17 16 16 14 15 14 16 15 16

Complete the frequency table below.

<table>
<thead>
<tr>
<th>Age</th>
<th>Tally mark</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL

[3]

6 (a) A fair coin is tossed twice. List all the possible outcomes.

[2]
(b) A car was purchased at K20 000.00. Calculate the value of the car after 5 years, if depreciation for this period was 25%.

(c) Study the program below and answer the question that follows.

Start

Enter radius,

If radius < 0

Then display "Error message" and re-enter positive radius,

Else enter height,

If height < 0

Then display "Error message" and re-enter positive height,

Else volume = $\pi \times$ square radius \times height,

EndIf

EndIf

Display volume,

Stop

Use the program to complete the table below (take $\pi$ to be $\frac{22}{7}$).

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radius</td>
<td>Height</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
</tr>
</tbody>
</table>

(d) Given that $A = \begin{pmatrix} 2 & 2 \\ 0 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} 1 \\ 2 \\ 1 \end{pmatrix}$, calculate $AB$.

[Total: 10]
7 (a) Find the sum of \(x^2 - 2xy\) and \(3x^2 + 3xy + xy\). [2]

(b) A man worked for 55 hours in a certain week. His basic rate is K6.00 per hour and the rate for overtime is 'time and a half'. Calculate his total wage for the week if his normal working time each week is 40 hours. [3]

(c) The figure ABCDEF below is a triangular prism. AC = 10cm, CF = 15cm and the height of triangle ABC is 6cm.

![Diagram of ABCDEF]

Find the volume of the prism ABCDEF. [3]
(d) A ladder 10m long leans against a wall so that its foot is 8m from the wall.

(i) Using a scale of 1cm to represent 1m, construct a triangle to show this data. [1]

(ii) Measure and write the angle of elevation of the upper end of the ladder from its foot. [1]

8 (a) Mrs Musonda intends to go on holiday to America. She has K13 000.00 to spend. How much is this amount in dollars, given that $1 = K6.50? [2]
(b) Factorise completely $3a^2b + 4ab^2 + ab$. 

(c) A baker bought 30 eggs for making a cake. He discovered that 6 eggs were bad. Find the ratio of good eggs to the total number of eggs he bought, in its lowest terms.

(d) The frequency table below shows the ages of children who were vaccinated against measles at Kansakala Clinic on a certain day.

<table>
<thead>
<tr>
<th>Age</th>
<th>1-3</th>
<th>4-6</th>
<th>7-9</th>
<th>10-12</th>
<th>13-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of children</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

(i) Find the modal class.

(ii) Calculate the mean age.
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