<table>
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<tr>
<th>TABLE</th>
<th>EXAMINER</th>
<th>MARKER</th>
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INSTRUCTIONS

Read the following instructions carefully:

1. This paper consists of two (2) sections – Sections I and II.

2. There are six (6) questions in Section I and three (3) questions in Section II.

3. Attempt ALL six (6) questions in Section I.

4. Answer ANY TWO (2) questions in Section II.

5. Write your answers in the spaces provided in this test booklet.

6. Write proper statements and show all working.

7. If you have finished before time is called, go back and check your work.

8. Remember to complete the following on the cover of your answer booklet:
   - Student’s Name
   - School’s Name
   - School’s ID
   - Student’s Number

9. Candidates are permitted to use the following materials:
   - Calculators (Non-Programmable)
   - Geometry Set
   - Graph Paper (provided)

**NO PROGRAMMABLE CALCULATORS MUST BE USED.**

**NO CELLPHONE CALCULATORS ARE ALLOWED.**
SECTION I

ANSWER ALL QUESTIONS IN THIS SECTION

Write your answers in the spaces provided and show ALL working.

1. (a) Calculate the exact value of

\[
\left( \frac{4}{7} - \frac{1}{3} \right) \times \frac{7}{10} = \frac{5}{2} \times \frac{7}{10} = \frac{1}{6}
\]

(b) Express 2.125 as an improper fraction.

\[
2 \frac{125}{1000} = 2 \frac{10}{8} = \frac{17}{8}
\]

(c) Express 5678 in standard form.

\[
5.678 \times 10^3
\]

[ TOTAL 6 marks]
2. (a) A piece of ribbon is cut into two pieces in the ratio 3:7. The length of the shorter piece is 45 cm. Calculate the length, in cm, of the longer piece of ribbon.

\[\frac{3}{7} = \frac{45}{x}\]

\[\frac{3 \times 15}{7 \times 15} = \frac{45}{x} \quad \text{equivalent fractions}\]

\[x = 7 \times 15 = 105\]

(b) (i) Convert Bds $140.00 into US $ using the following exchange rate:

<table>
<thead>
<tr>
<th>EXCHANGE RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bds $2.00 = US $1.00</td>
</tr>
</tbody>
</table>

\[
\text{Bds $1 = US \$ \frac{1}{2}} \quad \text{or} \quad \text{US $0.50}
\]

\[
\therefore \text{Bds $140 = \frac{1}{2} \times 140 = US $70}
\]

(ii) Bob converted Bds $140.00 into US $. If a 2% tax was charged on the transaction, how much money, in US dollars, did he get after paying the tax?

\[
\text{Tax charged} = \frac{2}{100} \times 70 = \text{US $1.40}
\]

\[
\text{Balance after tax} = 70 - 1.40 = \text{US $68.60}
\]

[TOTAL: 6 marks]
3. (a) The arrow diagram shown below represents a mapping between the members of set \(X\) and the members of set \(Y\).

\[
\begin{array}{c|c}
X & Y \\
\hline
5 & 25 \\
7 & 49 \\
9 & ? \\
\end{array}
\]

(i) State an equation which represents the relationship between \(x\) and \(y\).

\[y = x^2\]

(ii) State the image of 9.

\[9^2 = 81\]

(iii) Is this relation a one-to-one, a many-to-one or one to many?

one-to-one

(b) Lucas ran a 400 m race in 50.0 seconds.

Calculate his speed in metres per second.

\[
\text{Speed} = \frac{\text{Distance}}{\text{Time}}
\]

\[
= \frac{400\text{ metres}}{50\text{ seconds}}
\]

\[
= 8 \text{ metres per second}
\]

or \(8 \text{ m/s}\)

or \(8 \text{ m s}^{-1}\)

[TOTAL 6 marks]
4. Ideal Bank pays 8% Simple Interest per annum on savings.

Mr. Brown deposited $12 000.00 at Ideal Bank.

(a) How much time will it take Mr. Brown to earn Simple Interest of $2 400.00 on his deposit?

\[
\text{Simple Interest} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}
\]

\[
\text{Time} = \frac{\text{Simple Interest} \times 100}{\text{Principal} \times \text{Rate}}
\]

\[
= \frac{2400 \times 100}{12000 \times 8} = \frac{10}{4} = 2.5 = 2 \frac{1}{2} \text{ years}
\]

(b) Calculate the amount Mr. Brown would earn after 5 years.

\[
\text{Simple Interest} = \frac{12000 \times 8 \times 5}{100}
\]

\[
= \$4800
\]

[TOTAL 6 marks]
5. A pack of 8 exercise books cost $x.

A pen costs $12.00 more than a pack of exercise books.

(a) Write, in terms of $x$, the cost of 1 pen. [1 mark]

\[ x + 12 \]

(b) The total cost of 1 pack of exercise books and 1 pen is $76.00.

Express this information as an equation in $x$.

\[ x + x + 12 = 76 \]
\[ 2x + 12 = 76 \] [2 marks]

(c) Solve the equation in Part (b) above to determine, in dollars, the cost of 1 exercise book.

\[ 2x + 12 = 76 \]
\[ 2x = 64 \]
\[ x = \frac{64}{2} \]
\[ x = 32 \]

8 exercise books costs $32

1 exercise book will cost \( \frac{32}{8} = 4 \)

\[ = \$4.00 \] [TOTAL 6 marks]
6. (a) The Pie Chart shows how Ms. Chen spends her monthly income of $6000.00.

(i) How much, in dollars, is Ms. Chen's loan payment?

One quarter of the pie chart represents her loan payment, which is \( \frac{1}{4} \times 6000 = \$1500 \) [2 marks]

(ii) Calculate the value of \( x \).

\[
x + 120^\circ + 90^\circ + 90^\circ = 360^\circ
\]

Angles at a point add up to \( 360^\circ \)

\[
\therefore x = 360 - 120 - 90 - 90 = 60^\circ
\]

[2 marks]
(b) ABCD is a trapezium with parallel sides AD and BC.

Angle ACB = 35°. The length of the sides AC and AD are equal.

Calculate the value of x.

\[ \hat{AD} = \hat{ACB} = 35° \]  (alternate angles)

Triangle ACD is an isosceles triangle because \( AC = AD \)

\[ x = \frac{180 - 35}{2} = 72.5° \]  [3 marks]

[TOTAL 7 marks]
SECTION II

ANSWER ANY TWO (2) QUESTIONS IN THIS SECTION
(Show ALL working)

7 (a) Jamal can purchase a flat screen television in two ways.

<table>
<thead>
<tr>
<th>HIRE PURCHASE</th>
<th>CASH PURCHASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Down Payment  $480.00</td>
<td>Cash Price $9800.00</td>
</tr>
<tr>
<td>Monthly installment of $320.00 for 2 1/2 years.</td>
<td>+</td>
</tr>
<tr>
<td>10% Discount on Cash Price</td>
<td></td>
</tr>
</tbody>
</table>

(i) Calculate the total cost of the flat screen television under Hire Purchase.

\[
\text{Hire purchase price} = \text{down payment} + \text{installments} \quad [2 \text{ marks}]
\]

\[
2 \frac{1}{2} \text{ years} = 30 \text{ months}
\]

\[
\text{Total installment} = 320 \times 30 = $9600
\]

\[
\text{Hire purchase} = 480 + 9600 = $10,080
\]

(ii) How much does Jamal pay for the flat screen television, if he chooses the Cash Purchase?

\[
\text{Discount} = \frac{10}{100} \times 9800 = $980.00 \quad [2 \text{ marks}]
\]

\[
\text{Cash Purchase} = 9800 - 980 = $8820
\]

(iii) How much would Jamal save if he chooses the Cash Purchase over the Hire Purchase of the flat screen television?

\[
\text{He will save} = 10,080 - 8820 = $1260 \quad [2 \text{ marks}]
\]
(b) A clothes vendor bought a number of T-shirts costing $15.00 each, paying a total of $2625.00.

(i) Calculate the number of T-shirts bought.

\[
\text{No. of T-shirts} = \frac{2625}{15} = 175
\]

[2 marks]

(ii) If each T-shirt is sold for $22.00, calculate the total profit made after selling all the T-shirts.

\[
\begin{align*}
\text{Cost Price} & = \$15 \\
\text{Selling Price} & = \$22 \\
\text{Profit on each T-shirt} & = 22 - 15 = \$7 \\
\text{Total profit} & = 175 \times 7 \\
& = \$1225
\end{align*}
\]

[4 marks]

**OR**

\[
\begin{align*}
\text{Cost price of 175 T-shirts} & = \$2625 \\
\text{Selling price of 175 T-shirts} & = 175 \times 22 = \$3850 \\
\text{Total profit} & = 3850 - 2625 \\
& = \$1225
\end{align*}
\]

TOTAL: [12 marks]
8. The equation \( y = 3x - 4 \) represents the relationship between two variables \( x \) and \( y \).

(a) (i) Use the given equation \( y = 3x - 4 \) to complete the table below.

<table>
<thead>
<tr>
<th>( x )</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>2</td>
<td>8</td>
<td>14</td>
<td>20</td>
</tr>
</tbody>
</table>

\[
\text{when } x = 4 \quad y = 3(4) - 4 = 12 - 4 = 8
\]

\[
\text{when } x = 6 \quad y = 3(6) - 4 = 18 - 4 = 14
\]

\[
\text{when } x = 8 \quad y = 3(8) - 4 = 24 - 4 = 20
\]

(ii) Using the grid given on page 12 and a suitable scale on the y-axis, plot the points from your table above and draw the graph of \( y = 3x - 4 \).

(iii) From the graph, determine the value of \( y \) at \( x = 5 \).

\[
\text{when } x = 5 \quad y = 11
\]
(b) In the diagram below (not drawn to scale), the height of the coconut tree is represented by the side $BG$ of triangle $BGM$.

Matthew stands at a point $M$, which is 60 metres from $G$, the base of the coconut tree. He sees a bird at the top of the tree at an angle of elevation $59^0$ as shown in the diagram above.

Calculate the height of the tree in metres. 

$$\frac{BG}{60} = \tan (59^0)$$

$$BG = 60 \tan (59^0)$$

$$= 99.9 \text{ m (to 1 d.p.)}$$

[Total 12 marks]
9. (a) A cylindrical barrel of height 1 m and diameter 28 cm is shown in the following diagram.

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

Radius = 14 cm
1 metre = 100 centimetre

(i) Calculate the volume, in cm$^3$, of the cylindrical barrel.

$$\text{Volume} = \text{cross-sectional area} \times \text{height}$$

$$\text{Area of circle} \times \text{height}$$

$$\pi r^2 \times \text{height}$$

$$\frac{22}{7} \times 14 \times 14 \times \frac{1}{100}$$

$$= \frac{616}{100}$$

$$= 6160 \text{ cm}^3$$

(ii) How many containers each holding 12 320 cm$^3$ of water will be required to fill the barrel.

$$\frac{61600}{12320} = 5$$
(b) The table shows the results of a survey on the type of snacks preferred by students in a Form 3 class.

<table>
<thead>
<tr>
<th>Type of snacks</th>
<th>Chocolate</th>
<th>Peanuts</th>
<th>Donuts</th>
<th>Biscuits</th>
<th>Fruits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students</td>
<td>8</td>
<td>6</td>
<td>9</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

(i) What was the favourite snack of the students in the survey?

Donuts was the favourite snack

(ii) How many more students preferred chocolate than fruits?

\[ 8 - 5 = 3 \]

Three students preferred chocolate more than fruits

(iii) Calculate the total number of students in the survey.

\[ 8 + 6 + 9 + 2 + 5 = 30 \]

Thirty students were in the survey

(c) An ordinary fair die is thrown.

(i) List all the possible outcomes.

1, 2, 3, 4, 5, 6

(ii) What is the probability of obtaining an odd number?

There are three odd numbers: 1, 3, 5

Probability of obtaining an odd number = \( \frac{3}{6} = \frac{1}{2} \)

[TOTAL 12 marks]

END OF TEST