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

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

\[
= \frac{12 - 7}{21} \times \frac{7}{10}
\]

\[
= \frac{51}{3} \times \frac{11}{10} = \frac{1}{6}
\]

[3 marks]

(b) Express 2.125 as an improper fraction.

\[
2.125 = 2 \frac{1}{8}
\]

\[
= \frac{17}{8}
\]

[2 marks]

(c) Express 5678 in standard form.

\[
5678 = 5.678 \times 10^3
\]

[1 mark]

[ 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.

Total parts = 7 + 3 = 10

3 = 45
⇒ 1 = 15
⇒ 7 = 105 cm.

(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>

Bds $2.00 = US $1.00
⇒ Bds $1.00 = US $0.50
⇒ Bds $140 = US $70.00

(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?

\[
\frac{2}{100} \times 70 = 1.40
\]

70 - 1.40
= $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.

![Diagram with X and Y sets and mappings]

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

\[ y = x^2 \]  

[1 mark]

(ii) State the image of 9.

\[ y = (9)^2 = 81 \]  

[2 marks]

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

One-to-one  

[1 mark]

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

Calculate his speed in metres per second.

\[ \text{Speed} = \frac{\text{Dist.}}{\text{time}} \]

\[ = \frac{400}{50} \]

\[ = 8 \text{ ms}^{-1} \]  

[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?

\[
T = \frac{I \times 100}{P \times R} = \frac{2400 \times 100}{12000 \times 0.08} = 2 \frac{1}{3}
\]

\[
T = 2 \frac{1}{3} \text{ years.}
\]

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

\[
SI = \frac{P \times R \times T}{100} = \frac{12000 \times 0.08 \times 5}{100} = 4800
\]

\[
A = SI + P = 4800 + 12000 = 16800
\]

[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. 
   \[ P = x + 12 \] 

   [1 mark]

   (b) The total cost of 1 pack of exercise books and 1 pen is $76.00.
   Express this information as an equation in \( x \).
   \[ x + P = 76 \]
   \[ x + (x + 12) = 76 \]
   \[ 2x + 12 = 76 \]
   \[ 2x = 64 \]
   \[ x = \$32 \]

   [2 marks]

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

   \[ \frac{32}{8} = \$4.00 \]

   [3 marks]

   [TOTAL 6 marks]
6. (a) The Pie Chart shows how Ms. Chen spends her monthly income of $6 000.00.

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

\[
\frac{96.15}{6364} \times \frac{100}{6000} = 1500
\]

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

\[
x = 360 - 180 - 120
\]
\[
x = 360 - 300
\]
\[
x = 60^\circ.
\]

[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 \( x \).

\[
\begin{align*}
180 - 35 &= \frac{145}{2} \\
&= 72.5^\circ
\end{align*}
\]
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.

**HIRE PURCHASE**

<table>
<thead>
<tr>
<th>Down Payment</th>
<th>$480.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly installment</td>
<td>$320.00</td>
</tr>
<tr>
<td>for 2 1/2 years.</td>
<td></td>
</tr>
</tbody>
</table>

**CASH PURCHASE**

| Cash Price | $9800.00 |
| +          |          |
| 10% Discount on Cash Price | |

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

\[
(30 \times 320) + 480 \\
= 9600 + 480 \\
= \$10080
\]

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

\[
\frac{10}{10\%} \times \frac{9800}{980} = \$980 \\
\]

\[\text{An} s. \$8820.
\]

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

\[
\$10080 - \$8820 = \$1260 saved.
\]

[2 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.

\[
\frac{2625}{15} = 175 \text{ shirts.}
\]

[2 marks]

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

\[
\text{Profit} = 175 \times 7 = 1225.
\]

[4 marks]

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>

[3 marks]

(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 $y = 3x - 4$.

See Graph Sheet.

[4 marks]

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

$y = 11$

[1 mark]
(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° as shown in the diagram above.

Calculate the height of the tree in metres. 

\[
\tan 59 = \frac{\text{Opp}}{\text{adj}} = \frac{\text{Opp}}{60}
\]

\[
\text{Opp} = 60 \times \tan 59
\]

\[
= 99.8 \text{ m}
\]

\[
\approx 100 \text{ m}
\]

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

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

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

\[ V = \pi r^2 h \]
\[ = \frac{22}{7} \times 14 \times 14 \times 100 \]
\[ = 4400 \times 14 \]
\[ = 61600 \text{ cm}^3 \]

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

\[ \frac{61600}{12320} = 5 \text{ containers} \]
(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.

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

\[8 - 5 = 3\] students

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

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

(c) An ordinary fair die is thrown.

(i) List all the possible outcomes.

\[1, 2, 3, 4, 5, 6\] - 6 outcomes

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

\[\frac{3}{6} = \frac{1}{2}\]

[TOTAL 12 marks]