MARKS: 150

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Method</td>
</tr>
<tr>
<td>M/A</td>
<td>Method with accuracy</td>
</tr>
<tr>
<td>CA</td>
<td>Consistent accuracy</td>
</tr>
<tr>
<td>A</td>
<td>Accuracy</td>
</tr>
<tr>
<td>C</td>
<td>Conversion</td>
</tr>
<tr>
<td>S</td>
<td>Simplification</td>
</tr>
<tr>
<td>RT/RG</td>
<td>Reading from a table/Reading from a graph</td>
</tr>
<tr>
<td>SF</td>
<td>Correct substitution in a formula</td>
</tr>
<tr>
<td>O</td>
<td>Opinion/Example</td>
</tr>
<tr>
<td>P</td>
<td>Penalty, e.g. for no units, incorrect rounding off, etc.</td>
</tr>
<tr>
<td>R</td>
<td>Rounding off</td>
</tr>
<tr>
<td>NPR</td>
<td>No penalty for rounding</td>
</tr>
</tbody>
</table>

This memorandum consists of 20 pages.
**QUESTION 1 [38 MARKS]**

<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.1</td>
<td>The data is <strong>discrete</strong>, because the <strong>violent incidents</strong> is counted/whole numbers/integral values /categorised ✓ □</td>
<td>1A correct type 1O reason</td>
</tr>
</tbody>
</table>
| *1.1.2 | Total number of incidents involving boys  
= 13 + 12 + 18 + 11 + 10 + 16  
= 80 ✓ S  
Total number of incidents involving girls  
= 7 + 3 + 4 + 7 + 5 + 19 ✓ RG  
= 45 ✓ CA  
Difference = 80 – 45  
= 35 ✓ CA | 1S total number of boys 1RG reading from graph 1CA total number of girls | L3 |
| **OR** | Total for boys and girls  
= 20+15+22+18+15+35  
= 125 ✓ S  
Total for boys  
= 13 + 12 + 18 + 11 + 10 + 16  
= 80 ✓ S  
Number of girls = 125 – 80  
= 45 ✓ CA  
Difference = 80 – 45  
= 35 ✓ CA | 1S Total number of boys and girls 1S Total number of boys 1CA number of girls 1CA Difference | |
| **OR** | The total of the differences between boys and girls  
✓ A ✓ A ✓ A  
= 6 + 9 + 14 + 4 + 5 – 3  
= 35 ✓ CA | 2A Positive differences 1A for negative 3 1CA the differences Max 2 marks if part data used | |

* This question must not be marked in Limpopo. The paper will be marked out of 143 and scaled and then the candidates’ total mark will be up-scaled to 150 marks
<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| *1.1.3 | Cyber bullying ✓ A  
Girls avoiding physical violence. ✓✓ O  
OR  
Girls are afraid of confrontation and fighting ✓✓ O  
OR ✓✓ O  
Easier to express their emotions/feelings on social media | 1A/RG reading from graph  
2O explanation |
| 1.2.1 | Range = Highest value – Lowest value  
5 = 18 – A ✓ M  
A = 13 ✓ CA  
OR ✓ M  
A = 18 – 5 = 13 ✓ CA | 1M concept of range  
1CA value of A  
OR  
1M concept of range using 5  
1CA value of A  
Answer only full marks |
| 1.2.2 | Mean = \[
\frac{13+14\times4+15\times5+16\times10+17\times13+18\times7}{40}\]
\[
\frac{651}{40}\]
\[
= 16.275\] | NB: Answer from Q 1.2.1  
1M adding all 40 values  
1A dividing by 40  
1CA Simplification  
NPR  
Answer only full marks |

* This question must not be marked in Limpopo. The paper will be marked out of 143 and scaled and then the candidates’ total mark will be up-scaled to 150 marks
<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2.3</td>
<td>(B = \frac{15 + 16}{2} = 15.5) ✓ CA</td>
<td>1A identifying the correct values (1) CA value of B [If only B = 15 then one mark] and \ If answer only B=23 then one mark]</td>
</tr>
<tr>
<td></td>
<td>(C = \frac{16 + 17}{2} = 16.5) ✓ CA</td>
<td>1 M concept of median (1) CA value of C</td>
</tr>
<tr>
<td></td>
<td>(D = 17) ✓ CA</td>
<td>(1) CA value of D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Answer Only full marks (5)</td>
</tr>
<tr>
<td>1.2.4</td>
<td>(P = \frac{30}{40} = 0.75) ✓ CA</td>
<td>1A 30 grade 9 boys (1) A no. of boys 40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1CA decimal Answer Only full marks (3)</td>
</tr>
<tr>
<td>1.2.5</td>
<td>The grade 9 boys are too old for their grade. ✓ ✓ J OR Social: ✓ ✓ J Need recognition / low self-esteem / identity crisis. OR Economic: To gain favours from others. ✓ ✓ J OR Educational: They are frustrated by their lack of progress. ✓ ✓ J OR Environmental factors/emotional factors ✓ ✓ J OR Contextual factors/ No parental control/ Peer pressure ✓ ✓ J OR Violent community / child headed family/gang related</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2J reason (2)</td>
</tr>
<tr>
<td>Ques</td>
<td>Solution</td>
<td>Explanation</td>
</tr>
<tr>
<td>------</td>
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<td>-------------</td>
</tr>
</tbody>
</table>
| 1.3.1 | Total cost in Rand  
\[\checkmark A \checkmark A \checkmark A \checkmark A \]  
\[= 300 \text{ for the first } 15 \text{ passengers } + 50 \times \text{ the number of persons more than } 15 \checkmark A \]  
\text{OR}  
Total cost (in Rand)  
\[\checkmark A \checkmark A \checkmark A \checkmark A \]  
\[= 300 + (\text{the number of persons } - 15) \times 50 \checkmark A \]  
\text{OR}  
Total cost (in Rand)  
\[\checkmark A \checkmark A \checkmark A \checkmark A \]  
\[= 300 + (n - 15) \times 50 \checkmark A \]  
Where \( n \) is the number of persons more than 15  
\text{OR}  
Total cost (in Rand)  
\[\checkmark A \checkmark A \checkmark A \checkmark A \]  
\[= (\text{number of persons}) \times 50 - 450 \checkmark A \]  
| 1A constant cost  
1A 15 persons  
1A number of persons more than 15  
1A multiply by the rate R50 | 1A constant cost  
1A using 15 persons  
1A using a variable with explanation  
1A multiply by the rate R50 | (4) |
| 1.3.2 (a) |  
\[\checkmark SF \]  
\[900 = 300 + (n - 15) \times 50 \]  
\[(n - 15) \times 50 = 600 \]  
\[n - 15 \text{ persons } = 12 \]  
\[n = 27 \checkmark A \]  
\text{OR}  
27 \checkmark RT | 1SF Substituting in formula  
1A Maximum number | L3  
2 RT Max number of passengers  
[Both 25 and 27 one mark and 25 only, no marks] | (2) |
### Ques 1.3.2 (b)

10 learners + 1 teacher  
10 learners + 1 teacher ✓✓MA  
4 learners + 1 teacher ✓A  
∴ 24 learners and 3 teachers ✓CA

\[
\begin{align*}
24 : 3 & \quad \text{✓ CA} \\
= 8 : 1 & \quad \text{✓ CA} \\
\end{align*}
\]

**OR**

1 educator for 10 learners ✓MA  
\[
\frac{1}{11} \times 27 = 2,454545... \text{ teachers } \quad \text{✓ CA}
\]
∴ 3 teachers ✓R

And 24 learners  
24 : 3 ✓ CA  
8 : 1 ✓ CA

**Explanation**

- **NB:** Use CA from Q1.3.2(a)  
- 2MA working with ratio  
- 1A Number of teachers  
- 1CA ratio in correct order  
- 1CA simplified ratio  
- **OR**  
- 1MA working with ratio  
- 1CA number of teachers  
- 1R Rounding up  
- 1CA ratio in correct order  
- 1CA simplified ratio

### Ques 1.3.3

There is only one double six. ✓ A  
There is 6 combinations of seven. ✓ A  
∴ Mr Boitumelo has a larger probability than Miss Ansie to accompany the learners. ✓ O

**OR**

\[
\begin{align*}
P(\text{double six}) &= \frac{1}{36} \approx 2,8\% \\
P(\text{seven}) &= \frac{6}{36} = \frac{1}{6} \approx 16,7\% \quad \text{✓ A}
\end{align*}
\]

∴ Mr Boitumelo has a larger probability than Miss Ansie to accompany the learners. ✓ O

**Explanation**

- 1A probability of double six  
- 1A probability of seven  
- 1O explanation  
- **OR**  
- 1A probability of double six  
- 1A probability of seven  
- 1O explanation

### [38]
QUESTION 2 [33MARKS]

<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1.1</td>
<td>Volume of petrol = ( \frac{R500}{R14.04} ) litre  √ M</td>
<td>1M dividing by R14.04/ ℓ</td>
</tr>
<tr>
<td></td>
<td>= 35,61253561 litre  √ A</td>
<td>1A volume</td>
</tr>
<tr>
<td></td>
<td>Distance each model can travel with 35,613 ℓ of petrol:</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Sonic 1.6:</strong> ( \frac{35,613}{6.7} ) × 100 km ≈ 531.54 km  √ CA</td>
<td>1CA distance</td>
</tr>
<tr>
<td></td>
<td><strong>Aveo 1.6:</strong> ( \frac{35,613}{7.3} ) × 100 km ≈ 487.85 km  √ CA</td>
<td>1CA distance</td>
</tr>
<tr>
<td></td>
<td>∴ <strong>Sonic 1.6</strong> will travel a greater distance.  √ √ O</td>
<td>2O conclusion</td>
</tr>
<tr>
<td></td>
<td><strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>√ M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Volume of petrol = ( \frac{R500}{R14.04/ℓ} ) = 35,613 ℓ  √ A</td>
<td>1M dividing by R14.04/ ℓ</td>
</tr>
<tr>
<td></td>
<td>Finding distance using consumption rate for each model:</td>
<td>1A volume</td>
</tr>
<tr>
<td></td>
<td>Sonic rate = ( \frac{100km}{6.7ℓ} ) = 14,925 km/ℓ</td>
<td>1CA distance</td>
</tr>
<tr>
<td></td>
<td>Distance = 14,925 km/ℓ × 35,613 ≈ 531.5 km  √ CA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aveo rate = ( \frac{100km}{7.3ℓ} ) = 13.70 km/ℓ</td>
<td>1CA distance</td>
</tr>
<tr>
<td></td>
<td>Distance = 13.70 km/ℓ × 35,613 ≈ 487.9 km  √ CA</td>
<td>2O conclusion</td>
</tr>
<tr>
<td></td>
<td>∴ <strong>Sonic 1.6</strong> will travel a greater distance.  √ √ O</td>
<td>[Correct conclusion only 2 marks]</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| 2.1.2 | Number of stops and the length of stopping while the engine is running. ✓ O  
The driving pattern of the driver for example fast acceleration and hard breaking. ✓ O  
OR  
Driving at high speeds with open windows  
OR  
Use of the air conditioner. ✓ O  
OR  
The condition of the car with relation to tyre pressure, load, etc. ✓ O  
OR  
Condition of the road surface, and the slope of the road. ✓ O  
OR  
Mechanical fault / condition / Electronic damage  
OR  
Load and number of passengers in vehicle ✓ O  
OR  
Traffic congestion ✓ O | L4 |

(2)  

2.1.3  

**Sonic**  
Monthly petrol cost (in Rand)  
\[ \frac{35000}{12} \times 14.04 \times 6.7 = 2743.65 \text{ CA} \]  
Total running cost (in Rand) = 2743.65 + 2657.00  
= 5400.65 \text{ CA}  
**Aveo**  
Monthly petrol cost (in Rand)  
\[ \frac{35000}{12} \times 14.04 \times 7.3 = 2989.35 \text{ CA} \]  
Total running cost (in Rand) = 2989.35 + 1942.00  
= 4931.35 \text{ CA}  
\[ \therefore \text{ Aveo 1.6 is more economical.} \ ✓ O \]  
OR  
[3 out of 8 marks if petrol cost ignored]  

1M dividing by 12  
1A multiply petrol price  
1MA multiply by consumption rate  
1 CA petrol cost Sonic  
1CA total running cost for the Sonic  
1 CA petrol cost Aveo  
1CA total running cost for the Aveo  
1O conclusion
### Ques 2.1.3 Cont.

#### Sonic 1.6
- Instalment cost per year: \(12 \times R\, 2\,657 = R\, 31\,884\)
- Petrol cost per year: \(35\,000 \,\text{km} \times \frac{6.7\ell}{100\text{km}} \times R14.04/\ell = 2\,345 \times R14.04 = R\, 32\,923.80\)
- Total running cost for the year:
  \(= \text{monthly instalments for 12 months} + \text{petrol cost per year}\)
  \(= R\, 31\,884 + R\, 32\,923.80 = R\, 64\,807.80\)

#### Aveo 1.6
- Instalment cost per year: \(12 \times R\, 1\,942 = R\, 23\,304\)
- Petrol cost per year: \(35\,000 \,\text{km} \times \frac{7.3\ell}{100\text{km}} \times R14.04/\ell = 2\,555 \times R14.04 = R\, 35\,872.20\)
- Total running cost for the year:
  \(= \text{monthly instalments for 12 months} + \text{petrol cost per year}\)
  \(= R\, 23\,304 + R\, 35\,872.20 = R\, 59\,176.20\)

The Aveo 1.6 is more economical. OR

<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| 2.1.3 Cont. | Sonic 1.6 | 1M multiplying by 12
| | Instalment cost per year: \(12 \times R\, 2\,657 = R\, 31\,884\) | 1MA multiply by consumption rate
| | Petrol cost per year: \(35\,000 \,\text{km} \times \frac{6.7\ell}{100\text{km}} \times R14.04/\ell \times R\, 32\,923.80\) | 1A multiply petrol price
| | Total running cost for the year: \(= \text{monthly instalments for 12 months} + \text{petrol cost per year}\) \(= R\, 31\,884 + R\, 32\,923.80 = R\, 64\,807.80\) | 1CA petrol cost Sonic
| | Aveo 1.6 | 1CA total running cost for the Sonic
| | Instalment cost per year: \(12 \times R\, 1\,942 = R\, 23\,304\) | 1 CA petrol cost Aveo
| | Petrol cost per year: \(35\,000 \,\text{km} \times \frac{7.3\ell}{100\text{km}} \times R14.04/\ell \times R\, 35\,872.20\) | 1CA total running cost for the Aveo
| | Total running cost per year: \(= \text{monthly instalments for 12 months} + \text{petrol cost per year}\) \(= R\, 23\,304 + R\, 35\,871.20 = R\, 59\,176.20\) | 1O conclusion

The Aveo 1.6 is more economical. OR

\(R14.04/\ell \times 6.7 = R94,068 \checkmark A\)

Sonic: \(R94,068 : 100\)
\[x : 35\,000\]
\[\therefore x = R32\,923.80 \checkmark CA\]

Total running cost: \(R32\,923.80 + 12 \times R\, 2\,657 = R\, 64\,807.80 \checkmark CA\)

Aveo: \(R14.04/\ell \times 7.3 = R102,492\)
\(R102,492 : 100\)
\[y : 35\,000\]
\[\therefore y = R35\,872.20 \checkmark CA\]

Total running cost: \(R35\,872.20 + 12 \times R\, 1\,942 = R\, 59\,176.20 \checkmark CA\)

\[\therefore \text{Aveo 1.6 is more economical. } \checkmark O\]

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<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2.1</td>
<td>Age 6 to 7 years.</td>
<td>2RG the age [6 or 7 one mark] [Including other intersection points ONLY one mark]</td>
<td>L2</td>
</tr>
<tr>
<td>2.2.2</td>
<td>Growth is a continuous phenomenon. OR Growth is affected by many factors like nutrition and health. OR It is influenced by genetic makeup inherited from parents. OR This graph is for average heights. OR Physical disabilities will influence height</td>
<td>1O any FIRST correct reason 1O for any SECOND correct reason</td>
<td>L4</td>
</tr>
<tr>
<td>2.2.3</td>
<td>Between 4 and 6 years Between 11 and 14 years</td>
<td>1RG reading from graph 1RG reading from graph [5 and 13 only one mark]</td>
<td>L2</td>
</tr>
<tr>
<td>2.2.4</td>
<td><strong>Boys stay longer</strong> than girls in childhood. OR Both girls and boys <strong>remain the same</strong> in pre-adolescence OR <strong>Girls stay longer</strong> in adolescence.</td>
<td>2RG comparing childhood stage 1RG comparing pre-adolescence 2RG comparing adolescence</td>
<td>L4</td>
</tr>
<tr>
<td>Ques</td>
<td>Solution</td>
<td>Explanation</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>---------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>2.2.4</td>
<td><strong>Cont.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Childhood</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Girls stay in childhood stage: 7 years <strong>✓ ✓ RG</strong></td>
<td>2RG number of years in childhood</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boys stay in childhood stage: 9 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Pre-adolescence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Girls stay in pre-adolescent stage: 2 years <strong>✓ RG</strong></td>
<td>1RG number of years in pre-adolescence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boys stay in pre-adolescent stage: 2 years <strong>✓ RG</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Adolescence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Girls stay in adolescent stage: 6 years <strong>✓ ✓ RG</strong></td>
<td>2RG number of years in adolescence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boys stay in adolescent stage: 4 years <strong>✓ ✓ RG</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>The girls’ height slows down/stabilizes/levels/evens out.</strong></td>
<td>2O trend</td>
<td></td>
</tr>
<tr>
<td>2.2.5</td>
<td><strong>OR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The girls’ growth rate relating to height decreases.</td>
<td>[0 marks or 2 marks]</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Trend relating to girls only</strong></td>
<td>[Trend relating to girls only]</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>2.2.6</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Height in inches</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$= 165 \times 0.3937$</td>
<td>1C conversion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$= 64.9605$</td>
<td>1A accuracy</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>✓ ✓ CA</strong></td>
<td>2CA conclusion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The boy’s height is <strong>above the average height for boys</strong></td>
<td>[Range 62 to 65]</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>OR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Height in cm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$= \frac{63}{0.3937}$</td>
<td>1C conversion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$= 160.02$</td>
<td>1A accuracy</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>✓ ✓ CA</strong></td>
<td>2CA conclusion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The boy’s height is <strong>above the average height for boys</strong></td>
<td>[Range 157 to 165]</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>2O trend</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>OR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>2CA conclusion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>L4</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### QUESTION 3 [34 MARKS]

<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| 3.1.1 | **Note: Afrikaans scripts to be marked differently**

Annual salary = R 20 416,67 × 12 = R 245 000,04  

\[ 1MA \text{ annual salary} \]

Pension = R 245 000,04 × 6% = R 14 700 ,00  

\[ 1CA \text{ pension} \]

Taxable amount without bonus  

\[ = R 245 000,04 – R 14 700,00 = R 230 300,04 \]  

\[ 1CA \text{ subtracting the pension} \]

Taxable annual income  

\[ = R230 300,04 + R20 416,67 = R250 716,71 \]  

\[ 1CA \text{ taxable annual income} \]

| OR | Monthly pension = R20 416,67 × 6% = R1 225   

\[ 1MA \text{ pension} \]

Monthly taxable salary = R20 416,67 – R1 225   

\[ = R19 191,67 \]  

\[ 1CA \text{ subtracting the pension} \]

Annual taxable income = R19 191,67 × 12 + R20 416,67   

\[ = R250 716,71 \]  

\[ 1CA \text{ taxable annual income} \]

| OR | Annual taxable income  

\[ = (13 \times R 20 416,67) – (12 \times R 20 416,67 \times 6\%) \]  

\[ = R 265 416,71 – R14 700 \]  

\[ = R250 716,71 \]  

\[ 1CA \text{ taxable annual income} \]

#### Rate of tax

\[ = R 29 808 + 25\% \times (R250 716,71 – R 165 600) \]  

\[ = R 29 808 + R 85 116,71 \times 25\% \]  

\[ = R 29 808 + R 21 279,18 \]  

\[ = R 51 087,18 \]  

\[ 1SA \text{ simplification} \]

\[ \text{Annual tax after rebate} = R 51 087,18 – R 12 080,00 \]  

\[ = R 39 007,18 \]  

\[ 1CA \text{ for tax amount after rebate} \]

\[ 1CA \text{ for tax amount after rebate} \]

NB: Amount from Q3.1.1  

1A for correct tax bracket  
1SF for substituting into the formula  
1S simplification  
1CA for tax amount  
NPR
### Question 3.1.3

<table>
<thead>
<tr>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly Tax = R 39 007,18 ÷ 12 = R 3 250,60</td>
<td>1CA for tax value per month</td>
</tr>
<tr>
<td>Net monthly salary = Monthly salary – pension – monthly tax</td>
<td>1M for subtracting both values</td>
</tr>
<tr>
<td>= R 20 416,67 – R 1 225 – R 3 250,60</td>
<td>1CA net salary [CA only if a monthly salary is used]</td>
</tr>
<tr>
<td>= R 15 941,07</td>
<td>OR</td>
</tr>
</tbody>
</table>

**OR**

<table>
<thead>
<tr>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual salary after tax</td>
<td>1M for subtracting both values</td>
</tr>
<tr>
<td>= Annual salary – pension – annual tax</td>
<td>1CA annual salary</td>
</tr>
<tr>
<td>= R245 000,04 – R 14 700,00 – 39 007,18</td>
<td>1CA monthly salary [dividing by 12]</td>
</tr>
<tr>
<td>= R 191 292,86</td>
<td>(3)</td>
</tr>
<tr>
<td>∴ Net monthly salary = ( \frac{R191292,86}{12} )</td>
<td>OR</td>
</tr>
<tr>
<td>= R15 941,07</td>
<td>CA</td>
</tr>
</tbody>
</table>

### Question 3.2.1

<table>
<thead>
<tr>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount if inflation rate was used for increase</td>
<td>1A correct amount from table</td>
</tr>
<tr>
<td>✓ A ✓ M</td>
<td>1M percentage increase</td>
</tr>
<tr>
<td>= R44,8 billion × 105,77%</td>
<td>1CA increased amount</td>
</tr>
<tr>
<td>= R47,38496 billion ✓ CA</td>
<td>1M comparing</td>
</tr>
<tr>
<td>✓ M</td>
<td>1O stating that she is correct</td>
</tr>
<tr>
<td>This amount is less than the amount which was allocated, therefore her claim was valid. ✓ O</td>
<td>OR</td>
</tr>
</tbody>
</table>

**OR**

<table>
<thead>
<tr>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount if inflation rate was used for increase</td>
<td>1A correct amount from table</td>
</tr>
<tr>
<td>✓ A ✓ M</td>
<td>1M percentage increase</td>
</tr>
<tr>
<td>= R44 800 000 000 × 105,77%</td>
<td>1CA increased amount</td>
</tr>
<tr>
<td>= R47 384 960 000 ✓ CA</td>
<td>1M comparing</td>
</tr>
<tr>
<td>✓ M</td>
<td>1O stating that she is correct</td>
</tr>
<tr>
<td>This amount is less than the amount which was allocated, therefore her claim was valid. ✓ O</td>
<td>OR</td>
</tr>
</tbody>
</table>

**OR**
<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| 3.2.1 Cont. | Difference = R47,9 billion – R44,8 billion ✓ A  
= R3,1 billion ✓ M  
Percentage increase  
= \( \frac{R3,1 \text{ billion}}{R44,8 \text{ billion}} \times 100\% \) ✓ MA  
\( \approx 6.9\% \) ✓ CA  
Her claim is valid. ✓ O  
[Word billion must be there when subtracting and not for %]  
**Note**  
* CA from Q3.2.1  
1A correct amount from table  
1M subtracting correct values  
1MA calculating the percentage increase  
1CA for rounding off  
1O stating that she is correct | (5) |
| 3.2.2 | Department of National Defence percentage growth from 2013/14 to 2014/15 is 6,9% ✓ CA  
South African national budget percentage growth from 2013/14 to 2014/15 ✓ M/A  
\( \frac{R1,25 \text{ trillion} – R1,15 \text{ trillion}}{R1,15 \text{ trillion}} \times 100\% \) ✓ M  
\( \approx 8,69\% \) ✓ CA  
Dr Khoza’s statement is correct. ✓ O  
* CA from Q3.2.1  
1CA correct percentage  
1M/A using correct values  
1M calculating growth %  
1CA calculating average %  
1O Stating that the increase is greater | (5) |
| 3.2.3 | Amount 2013/14 = 8,1% × R 41,6 billion + R41,6 billion ✓ M  
= R3,3639 billion + 41,6 billion  
= R44,9696 billion ✓ CA  
Amount 2014/15 = 5,9% × R 44,9696 billion + R44,9696 billion ✓ M  
= R2,6532064 billion + 44,9696 billion ✓ M  
= R 47,6228064 billion ✓ CA  
OR  
\( ✓ M \) ✓ CA  
Actual amount = R 41,6 billion × 108,1% = R 44,9696 billion  
\( ✓ M \) ✓ CA  
R 44,969 6 billion × 105,9% = R 47,622 806 4 billion  
or R 47 622 806 400  
1M for increasing by 8,1%  
1CA the amount  
1M for increasing by 5,9%  
1CA the amount  
**OR**  
1M for increasing by 8,1%  
1CA the amount  
1M for increasing by 5,9%  
1CA the amount  
NPR  
[Penalty 1 mark if billions omitted] | (4) |
<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.4</td>
<td>Difference = R48 billion - R47,9 billion = R 0,1 billion. In reality the difference is not 0,1 but an amount of R100 000 000 (one hundred million)</td>
<td>1O for identifying the difference of 0,1 billion. 1O For knowing that 0,1 billion is 100 000 000. Suitable example must be chosen.</td>
</tr>
<tr>
<td></td>
<td>Example: R 47,9 billion rounded R48 billion implies that there will be an over allocation of R100 million</td>
<td></td>
</tr>
<tr>
<td>3.3.1</td>
<td>A visual representation is more understandable (make sense of) for the general public than a table with values only.</td>
<td>2O reason</td>
</tr>
<tr>
<td></td>
<td>A visual representation is easier to read than text or table consisting of values.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The actual values are in billions and trillions which many people don’t understand, where in these graphs percentages are used which are more understandable.</td>
<td></td>
</tr>
<tr>
<td>3.3.2</td>
<td>A bar graph (multiple/compound) is more appropriate to display this data.</td>
<td>1O identifying the type of graph</td>
</tr>
<tr>
<td></td>
<td>The bar graph will allow for a much more-in-depth analysis of the trends in the collection of tax between the different categories over a period of time.</td>
<td>2O for explaining the advantage of a bar graph</td>
</tr>
<tr>
<td></td>
<td>OR Line or broken line graph</td>
<td>1O identifying the type of graph</td>
</tr>
<tr>
<td></td>
<td>The two lines will allow for a much more-in-depth analysis of the trends in the collection of tax between the different categories over a period of time.</td>
<td>2O for explaining the advantage of a broken line graph</td>
</tr>
</tbody>
</table>
### QUESTION 4 [45 marks]

<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| 4.1.1(a) | ✓A ✓A ✓CA M15 and M16 | 1A correct row number  
1A seat number  
1CA second seat number  
[15 and 16 two marks] |
| 4.1.1(b) | ✓A ✓A 24 × 2 = 48 seats | 1A 24 seats  
1A total number of seats |
| 4.1.1(c) | Total income in OR = (72×78) + (388×48) + (83×42)  
+ (81×28) + (112×15) + (82×10)  
| ✓S ✓RT ✓MA ✓RT | * seats from Q 4.1.1 (b)  
1MA adding the values  
1RT cost zone A and B  
1RT cost for zone C and D  
1RT cost for zone E and F  
1S simplification  
1CA answer  
[One mark for every 2 zones] |
| 4.1.2(a) | Cost for 1 zone B ticket = 48 OR ✓A  
= R27,2183 × 48  
= R 1 306,48 ✓C | 1A cost of ticket  
1C convert OR to Rand |
| Cost in Euro for one flight ticket = 492, 29 |  |
| Cost in OR for one flight ticket =  
= 492,29 ✓M  
1,87126 | 1M convert Euro to OR |
| = 263,08 | 1M convert OR to Rand |
| Cost in Rand for one flight ticket  
= 263,08 × R 27,2183 ✓M  
= 7 160, 59 ✓CA | 1CA cost of one ticket |
| Total cost per person  
= R 1 306,48 + R 7 160, 59  
= R 8 467,07 ✓CA | 1CA calculating total cost per person |
| Total cost for two = R 8 467,07 × 2  
= R 16 934,14 ✓CA | 1CA calculating total cost for two people |

OR

OR
### Ques | Solution | Explanation
--- | --- | ---
4.1.2(a) (cont.) | Cost for 2 zone B tickets = $2 \times 48$ OR = 96 OR  
= R27, 2183 × 96  
= R2 612, 96 ✓C  
Cost for 2 flight tickets = $2 \times €492, 29$  
= €984, 58 ✓A  
€984, 58 = \( \frac{27,2183 \times 984.58}{1,87126} \) ✓M  
= R14 321, 15 ✓CA  
Total cost = R2 612, 96 + R14 321, 15  
= R16 934, 11 ✓CA  
OR  
Cost for Zone B tickets: $2 \times 48$ OR = 96 OR ✓A  
Flight tickets in OR = \( \frac{2 \times 492.29}{1.87126} \) ✓C  
= 526,1588448 ✓CA  
Total cost: 526,1588448 + 96 = 622,1588448 ✓CA  
Cost in Rand = 622,1588448 × 27,2183 ✓C  
= 16 934,11 ✓CA  
1A cost for one ticket  
1C conversion  
1A 2 flight tickets  
2M convert Euro to rand  
1CA cost of 2 tickets in rand  
1CA total cost

4.1.2(b) | Time leaving Johannesburg + flight time  
= 20h30 +11h25 = 31h55 ✓A ✓CA  
Time in South Africa when they arrived: 07:55 or 7.55 am or five minutes to eight in the morning  
1A adding  
1CA correct time  
[If written as 07h55 one mark only]  
Answer only full marks (7) (2)  
L2

4.2.1 | South westerly (SW) ✓✓A  
OR  
South, south westerly (SSW)  
2A correct direction (2)  
L2
<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
<th>L4</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2.2</td>
<td>This chart only shows distances from Muscat. OR They don’t lie in the same direction. OR This is not a map / strip chart.</td>
<td>2O opinion</td>
<td></td>
</tr>
<tr>
<td>4.2.3</td>
<td>Muscat to Sydney $\approx 3,349,km \times 3.5$ $\approx 10,716.8$ to $11,721.5$ km</td>
<td>1RT correct value 1M multiplication by 3 349 1CA correct distance [Range of values 3.2 to 3.5] [3 or 4 then max 2 marks]</td>
<td>L2</td>
</tr>
<tr>
<td>4.3.1</td>
<td>$TSA = P \times H + K$ $A = 8 \times 110,mm \times 250,mm + 58,423,mm^2$ $= 220,000,mm^2 + 58,423,mm^2$ $= 278,423,mm^2 ,S$ $= 0.278,423,m^2 ,C$ For $0.07,m^2$ one needs $100,m\ell$ of paint $\therefore$ $1,m^2$ one need $\frac{100}{0.07} = 1,428.57,m\ell$ $\therefore 0.278423,m^2$ need $= 1428.571429 \times 0.278423 \approx 397.75,m\ell ,CA$ Two coats $= 2 \times 397.75 = 795.49,m\ell ,CA$ Number of spray cans $= \frac{795.49,m\ell}{250,m\ell} = 3.18184 \approx 4 ,CA$</td>
<td>1A total area of panels 1SF substitution in formula 1S simplification 1C conversion to $m^2$ 1M Method 1CA paint needed for 1 coat 1CA paint needed for 2 coats 1CA rounding up</td>
<td>L4</td>
</tr>
</tbody>
</table>
4.3.1 Cont.

**OR**

\[
\text{TSA} = P \times H + K
\]
\[
\begin{align*}
\sqrt{A} & \quad \sqrt{C} & \quad \sqrt{SF} \\
& = 8 \times 0,110 \text{ m} \times 0,250 \text{ m} + 0,058423 \text{ m}^2 \\
& = 0,22 \text{ m}^2 + 0,058423 \text{ m}^2 \\
& = 0,278423 \text{ m}^2 \checkmark S
\end{align*}
\]

For 0,07 m² one needs 100mℓ of paint
\[
\therefore 1 \text{ m}^2 \text{ one need } \frac{100}{0,07} \text{ mℓ} \checkmark M
\]
\[
= 1428,57 \text{ mℓ}
\]
\[
\therefore 0,278423 \text{ m}^2 \text{ need } = 1428,571429 \times 0,278423
\]
\[
= 397,7471429 \text{ mℓ} \checkmark CA
\]
\[
\approx 397,75 \text{ mℓ} \checkmark CA
\]

Two coats = \(2 \times 397,75 \text{ mℓ} \)
\[
= 795,49 \text{ mℓ} \checkmark CA
\]

Number of spray cans = \(\frac{795,49 \text{ mℓ}}{250 \text{ mℓ}}\)
\[
= 3,1819 \checkmark CA
\]
\[
\approx 4 \checkmark CA
\]

**OR**

\[
\text{TSA} = P \times H + K
\]
\[
\begin{align*}
\sqrt{A} & \quad \sqrt{C} & \quad \sqrt{SF} \\
& = 8 \times 0,110 \text{ m} \times 0,250 \text{ m} + 0,058423 \text{ m}^2 \\
& = 0,22 \text{ m}^2 + 0,058423 \text{ m}^2 \\
& = 0,278423 \text{ m}^2 \checkmark S
\end{align*}
\]

1 spray covers = 0,07 \(\times 2,5 \text{m}^2\)
\[
= 0,175 \checkmark CA
\]

Number of cans = \(\frac{0,2784823}{0,175} \times 2 \checkmark M\)
\[
= 3,1819 \checkmark CA
\]
\[
\approx 4 \checkmark CA
\]
### Ques | Solution | Explanation
--- | --- | ---
4.3.1 cont. | OR

\[
\text{TSA} = P \times H + K
\]

\[
= 8 \times 110\text{mm} \times 250\text{mm} + 0.058423\text{m}^2
\]

\[
= 8 \times 0.11\text{m} \times 0.25\text{m} + 0.058423\text{m}^2
\]

\[
= 0.22\text{m}^2 + 0.058423\text{m}^2
\]

\[
= 0.278423\text{m}^2
\]

\[
\text{100 ml covers 0.07 m}^2
\]

\[
\therefore 0.28\text{m}^2 \text{ will need} = \frac{100 \times 0.278423}{0.07}\text{ ml} \quad \checkmark \text{M}
\]

\[
= 397.7471429\text{ ml}
\]

\[
= 397.75\text{ ml} \quad \checkmark \text{CA}
\]

Two coats \[= 2 \times 397.75\text{ ml} = 795.5\text{ ml} \quad \checkmark \text{CA}\]

Number of spray cans \[= \frac{795.49\text{ ml}}{250\text{ ml}} = 3.181 \approx 4 \quad \checkmark \text{CA}\]

<table>
<thead>
<tr>
<th>Explanation</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A total area of panels</td>
<td>1A</td>
</tr>
<tr>
<td>1SF substitution in formula</td>
<td>1SF</td>
</tr>
<tr>
<td>1C conversion to m$^2$</td>
<td>1C</td>
</tr>
<tr>
<td>1S simplification</td>
<td>1S</td>
</tr>
<tr>
<td>1M method</td>
<td>1M</td>
</tr>
<tr>
<td>1CA paint needed for 1 coat</td>
<td>1CA</td>
</tr>
<tr>
<td>1CA paint needed for 2 coats</td>
<td>1CA</td>
</tr>
<tr>
<td>1CA rounding up</td>
<td>1CA</td>
</tr>
</tbody>
</table>

4.3.2

\[
\text{Height} = 240\text{ mm} \times 164
\]

\[
= 39360\text{ mm} \quad \checkmark \text{CA}
\]

\[
= 39.36\text{ meters} \quad \checkmark \text{C}
\]

\[\therefore \text{The height of the actual tower is approximately 39.4m}\]

<table>
<thead>
<tr>
<th>Explanation</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1MA correct height</td>
<td>1MA</td>
</tr>
<tr>
<td>1CA correct answer in mm</td>
<td>1CA</td>
</tr>
<tr>
<td>1C conversion</td>
<td>1C</td>
</tr>
</tbody>
</table>

4.3.2

\[
\text{Height} = 25\text{cm} - 1\text{cm} = 24\text{ cm} = 0.24\text{ m}
\]

Actual height \[= 0.24 \times 164 = 39.36\text{ m} \quad \checkmark \text{CA}\]

<table>
<thead>
<tr>
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<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1MA correct height</td>
<td>1MA</td>
</tr>
<tr>
<td>1C conversion</td>
<td>1C</td>
</tr>
<tr>
<td>1CA correct answer in m</td>
<td>1CA</td>
</tr>
</tbody>
</table>

4.4

1. **Mount** the vertical poles to the kick base and **fasten** with the screws.  

<table>
<thead>
<tr>
<th>Explanation</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A for the vertical poles</td>
<td>1A</td>
</tr>
<tr>
<td>1A for the screws</td>
<td>1A</td>
</tr>
</tbody>
</table>

2. **Slide** the three glass panels into the vertical poles.

<table>
<thead>
<tr>
<th>Explanation</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A glass panels</td>
<td>1A</td>
</tr>
</tbody>
</table>

3. **Place** the top aluminium frame on top and **fasten** with screws.

<table>
<thead>
<tr>
<th>Explanation</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A for the top frame</td>
<td>1A</td>
</tr>
<tr>
<td>1A Screws</td>
<td>1A</td>
</tr>
<tr>
<td>1A interior standards</td>
<td>1A</td>
</tr>
</tbody>
</table>

4. **Screw** the interior standards onto the aluminium framing and **insert** the brackets.

<table>
<thead>
<tr>
<th>Explanation</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A brackets</td>
<td>1A</td>
</tr>
<tr>
<td>[Single word answers not acceptable.]</td>
<td>[Single word answers not acceptable.]</td>
</tr>
</tbody>
</table>

[45]

**TOTAL: 150**