MARKS: 150
TIME: 3 hours

This question paper consists of 15 pages, 1 answer sheet and 2 annexures.
INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.

2. Use ANNEXURE 1 to answer QUESTION 1.1 and ANNEXURE 2 for QUESTION 3. Answer QUESTION 1.2.4 on the ANSWER SHEET. Write your centre number and examination number in the spaces on the ANSWER SHEET. Hand in the ANSWER SHEET with your ANSWER BOOK.

3. Number the answers correctly according to the numbering system used in this question paper.

4. Start EACH question on a NEW page.

5. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.

6. Show ALL the calculations clearly.

7. Round off ALL final answers appropriately according to the context, unless stated otherwise.

8. Indicate units of measurement, where applicable.

9. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.

10. Write neatly and legibly.
QUESTION 1

1.1 Eunice is an employee at Emoya High School. Her daily working hours are from 07:30 to 15:00 from Monday to Friday. Her total daily hours worked includes a 20-minute tea break and a 45-minute lunch break.

The following deductions are made from her gross monthly salary:

- 7.5% of her gross monthly salary for pension fund contributions
- UIF (Unemployment Insurance Fund) of 1% of her gross monthly salary
- PAYE (pay-as-you-earn) tax as per tax bracket

ANNEXURE 1 shows a copy of her salary advice that she received at the end of October 2013. Use the above information as well as ANNEXURE 1 to answer the following questions:

1.1.1 The new tax year, to which this salary advice is applicable, started on 1 March 2013.

Explain why the period on the salary advice is indicated as 08. (2)

1.1.2 Define the concept of *gross salary*. (2)

1.1.3 Calculate her housing allowance as a percentage of her gross salary. (2)

1.1.4 Show how the pension fund contribution of R596,40 was calculated. (2)

1.1.5 Write down the total pension fund contribution she has made thus far for the current tax year. (2)

1.1.6 Calculate the missing value A. (2)

1.1.7 Determine the difference between the overtime hourly rate paid for working during the week (Monday–Friday) and for working on Saturdays. (2)
1.2 Shanté makes fudge and sells it for pocket money. She uses the following recipe that was given to her by her grandmother. She sells the fudge for R2,50 a block.

**Recipe for 1 batch of fudge (54 blocks)**
- 1 tin of condensed milk
- 1 kg of sugar
- 250 g of butter
- 5 ml vanilla essence
- 250 ml milk

1.2.1 Write down a formula that Shanté can use to calculate her total income from the sale of blocks of fudge, in the form:

\[
\text{Total income (in rand)} = \ldots
\]

(2)

1.2.2 TABLE 1 shows her total income from the sale of blocks of fudge:

<table>
<thead>
<tr>
<th>Number of blocks</th>
<th>0</th>
<th>4</th>
<th>10</th>
<th>B</th>
<th>20</th>
<th>24</th>
<th>36</th>
<th>50</th>
<th>54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total income</td>
<td>0</td>
<td>10</td>
<td>25</td>
<td>30</td>
<td>50</td>
<td>60</td>
<td>90</td>
<td>125</td>
<td>135</td>
</tr>
<tr>
<td>(in rand)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Calculate the missing value B.

(2)

1.2.3 Shanté wants to determine the cost of making one batch of fudge. TABLE 2 below shows how the cost of the ingredients required per batch of fudge has been determined.

**TABLE 2: Cost of ingredients required per batch of fudge**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity purchased</th>
<th>Cost of item</th>
<th>Actual quantity of ingredients used</th>
<th>Actual cost of ingredients used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensed milk</td>
<td>1 tin</td>
<td>R12,89</td>
<td>1 tin</td>
<td>R12,89</td>
</tr>
<tr>
<td>Sugar</td>
<td>2,5 kg</td>
<td>R24,99</td>
<td>1 kg</td>
<td>R10,00</td>
</tr>
<tr>
<td>Butter</td>
<td>500 g</td>
<td>R30,55</td>
<td>250 g</td>
<td>R15,28</td>
</tr>
<tr>
<td>Vanilla essence</td>
<td>100 ml</td>
<td>C</td>
<td>5 ml</td>
<td>R0,59</td>
</tr>
<tr>
<td>Milk</td>
<td>1 litre</td>
<td>R6,95</td>
<td>250 ml</td>
<td>R1,74</td>
</tr>
<tr>
<td><strong>TOTAL COST</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>R40,50</strong></td>
</tr>
</tbody>
</table>

Answer the following questions:

(a) Show how Shanté calculated the actual cost of the sugar required for ONE batch of fudge.

(2)

(b) Calculate the number of batches of fudge she will be able to make with the quantity of milk she purchased.

(2)

(c) Determine the missing value C.

(2)

(d) Calculate the actual cost of the ingredients to make ONE block of fudge.

(2)
1.2.4 The ANSWER SHEET shows the line graph of Shanté's expenses to make one batch of fudge.

Whenever Shanté makes fudge she has to pay her mother a fixed amount for the use of the kitchen, electricity and water.

(a) Determine the fixed amount she pays her mother. (2)

(b) Draw another line graph on the ANSWER SHEET that shows her total income from the sale of different quantities of blocks of fudge. (5)

1.2.5 Explain the meaning of the point of intersection of the two straight lines representing expenses and income. (2)

[35]
QUESTION 2

2.1 Mrs De Klerk bought a 500 ml can of motor oil. She is aware that the can of oil is not filled to its fullest capacity. Below is a photograph of the can of motor oil and a diagram showing the external dimensions of the cylindrical can.

Photograph of the can of motor oil

Diagram of the cylindrical can of motor oil

NOTE: 1 cm³ = 1 ml

Calculate:

2.1.1 The actual capacity (volume) of the can

You may use the following formula:

\[
\text{Volume of a cylinder} = \pi \times (\text{radius})^2 \times \text{height} \quad \text{where} \quad \pi = 3.142
\]  \hspace{1cm} (4)

2.1.2 The volume of the empty space in the can when it is filled with 500 ml of motor oil

2.1.3 The height of the motor oil in the can

You may use the following formula:

\[
\text{Height of motor oil in can} = \frac{\text{volume of motor oil}}{\pi \times (\text{radius})^2} \quad \text{where} \quad \pi = 3.142
\]  \hspace{1cm} (3)
2.2 Mr Neymar owns a refuse removal company that removes refuse from building sites. His refuse containers are rusted and Mr Neymar wants to repaint the exterior sides of the containers.

Each container is an open-top right prism with two sides that are trapezium-shaped and two slanted sides that are rectangular.

The photograph below is of one of his refuse containers that he delivers to building sites. The dimensions of a container are shown on the diagram below.

Use the above diagram to answer the following questions:

2.2.1 Calculate the area (in mm$^2$) of the triangular part marked Y on the diagram.

You may use the following formula:

\[
\text{Area of a triangle} = \frac{1}{2} \times \text{base} \times \text{height}
\]  

2.2.2 Use the formula below to calculate the total exterior area (in m$^2$) of the trapezium side of the container if the area of the rectangular part X is equal to 2 088 000 mm$^2$.

You may use the following formula:

\[
\text{Area of a trapezium side of the container} = 2 \times (\text{area of part Y}) + (\text{area of part X})
\]

\[\text{NOTE: } 1 \text{ m}^2 = 1 000 000 \text{ mm}^2\]

2.2.3 The total exterior surface area of the container, excluding the top and the base, is 11,676 m$^2$.

Hence, calculate the area of ONE of the slanted rectangular sides of the container if they are identical in size.
2.3 To paint the exterior sides of the container it must first be rustproofed with a coat of Optirustbusta. It is then painted with Optimalcoat.

The technical consultant recommends that two layers of Optimalcoat must be applied.

Mr Neymar has 25 identical containers, each having an exterior area of 11,676 m², that need to be repainted as described above.

Optimalcoat is sold in 5 litre tins. One tin of Optimalcoat will cover 25 m².

2.3.1 Calculate the total area of all the containers that will be coated with Optirustbusta.

2.3.2 Determine the total number of coats of Optimalcoat that will be needed for all the containers.

2.3.3 Mr Neymar estimates that he needs to paint a total area of 585 m².

Calculate the minimum number of tins of Optimalcoat that he will need to order, based on his estimation.
QUESTION 3

Mamusi and her family live in Barkly West. She decided to take her family on a road trip to the Free State. In order to plan her trip she obtained a strip map at the tourist information centre in Barkly West. Part of this strip map has been reproduced on ANNEXURE 2.

Use ANNEXURE 2 to answer the following questions:

3.1 Mamusi travelled from Barkly West to Bloemfontein via Kimberley.

Name the towns or cities that they would pass through if they travelled on the N8 to Bloemfontein. (2)

3.2 Give the compass direction from Kimberley to Bloemfontein. (2)

3.3 According to the map the distance from Kimberley to Bloemfontein, using the N8, is 165 km.

Calculate the time (in hours and minutes) Mamusi would take to travel to Bloemfontein if she was driving at an average speed of 97,3 km/h.

You may use the following formula:

\[
\text{Time} = \frac{\text{distance}}{\text{average speed}}
\]

(5)

3.4 Mamusi decided to rather take the route via Boshof to Bloemfontein from Barkly West. Name the provincial or regional roads that they needed to take to get to Bloemfontein. (2)

3.5 After Mamusi and her family visited Bloemfontein they wanted to visit a family friend who lives in another town in the Free State. Below is a description of the routes they used from Bloemfontein.

- Travelled along route N8 to Petrusburg.
- At Petrusburg they turned onto route R48 and drove to Koffiefontein.
- At Koffiefontein they took route R704 and drove through Fauresmith and Jagersfontein.
- At Trompsburg they took route R717 in a southwesterly direction.
- They stopped at the next town where they visited their family friend.

Use the above description to determine the town where they would have visited their family friend. (3)

3.6 Calculate the distance between Koffiefontein and Luckhoff. (4)

3.7 Determine the scale used on the map if 5,4 cm on the map represents 2,7 km.

Write the scale in the form 1 : ... (3)
QUESTION 4

4.1 The IPL-T20 (Indian Premier League) is a cricket tournament in which each team gets to bat for 20 overs per match. Each team must get as many runs as possible from their 20 overs.

TABLE 3 shows statistics of the 2014 tournament that was played in Abu Dhabi. (Some of the details have been omitted.)

<table>
<thead>
<tr>
<th>Name of player</th>
<th>Number of matches played</th>
<th>Number of balls faced</th>
<th>Number of runs scored</th>
<th>Strike rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ajinkya Rahane</td>
<td>5</td>
<td>151</td>
<td>182</td>
<td>120,52</td>
</tr>
<tr>
<td>David Warner</td>
<td>5</td>
<td>145</td>
<td>163</td>
<td>112,41</td>
</tr>
<tr>
<td>Dwayne Smith</td>
<td>6</td>
<td>178</td>
<td>256</td>
<td>143,82</td>
</tr>
<tr>
<td>JP Duminy</td>
<td>5</td>
<td>128</td>
<td>173</td>
<td>135,15</td>
</tr>
<tr>
<td>Glenn Maxwell</td>
<td>5</td>
<td>125</td>
<td>300</td>
<td>201,34</td>
</tr>
<tr>
<td>Robin Uthappa</td>
<td>6</td>
<td>127</td>
<td>144</td>
<td>113,38</td>
</tr>
<tr>
<td>Brendon McCullum</td>
<td>6</td>
<td>191</td>
<td>249</td>
<td>130,36</td>
</tr>
<tr>
<td>Manish Pandey</td>
<td>6</td>
<td>121</td>
<td>145</td>
<td>R</td>
</tr>
<tr>
<td>Jacques Kallis</td>
<td>6</td>
<td>123</td>
<td>141</td>
<td>114,63</td>
</tr>
<tr>
<td>Aaron Finch</td>
<td>5</td>
<td>133</td>
<td>169</td>
<td>127,06</td>
</tr>
<tr>
<td>David Miller</td>
<td>5</td>
<td>96</td>
<td>155</td>
<td>161,45</td>
</tr>
</tbody>
</table>

(Source: www.iplt20.com

4.1.1 Arrange the number of runs scored in descending order. (2)

4.1.2 Determine which player scored the lowest number of runs. (2)

4.1.3 Calculate the mean number of runs scored by these players. (3)

4.1.4 The strike rate in cricket is determined using the following formula:

\[
\text{Strike rate} = \frac{\text{number of runs scored}}{\text{number of balls faced}} \times 100
\]

Use this formula to determine the missing value R. (2)

4.1.5 Determine the probability (as a percentage) of randomly selecting a player who has already played six matches. (2)
4.2 Consider the following statements:

A: The value that shows the mid-value for a set of given data.
B: The sum of the data divided by the number of data items.
C: The difference between Quartile 3 and Quartile 1.
D: The difference between the highest and lowest value in a set of data.
E: The item that occurs the most in a set of data.

State which ONE of the above statements BEST describes each of the following:

4.2.1 Interquartile range (2)
4.2.2 Mode (2)
4.2.3 Median (2)
4.3 TABLE 4 shows the number of births and deaths in South Africa from 2002 to 2013, as provided by Statistics South Africa.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of births</th>
<th>Number of deaths</th>
<th>Number of Aids-related deaths</th>
<th>Percentage of Aids-related deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>1 117 731</td>
<td>636 416</td>
<td>257 394</td>
<td>40,4</td>
</tr>
<tr>
<td>2003</td>
<td>1 119 820</td>
<td>674 281</td>
<td>295 237</td>
<td>43,8</td>
</tr>
<tr>
<td>2004</td>
<td>1 105 534</td>
<td>703 651</td>
<td>325 405</td>
<td>46,2</td>
</tr>
<tr>
<td>2005</td>
<td>1 095 999</td>
<td>722 075</td>
<td>344 657</td>
<td>47,7</td>
</tr>
<tr>
<td>2006</td>
<td>1 092 768</td>
<td>701 001</td>
<td>324 192</td>
<td>46,2</td>
</tr>
<tr>
<td>2007</td>
<td>1 098 959</td>
<td>657 051</td>
<td>280 098</td>
<td>42,6</td>
</tr>
<tr>
<td>2008</td>
<td>1 107 603</td>
<td>618 324</td>
<td>240 309</td>
<td>38,9</td>
</tr>
<tr>
<td>2009</td>
<td>1 114 301</td>
<td>591 135</td>
<td>211 903</td>
<td>35,8</td>
</tr>
<tr>
<td>2010</td>
<td>1 123 409</td>
<td>580 673</td>
<td>201 174</td>
<td>34,6</td>
</tr>
<tr>
<td>2011</td>
<td>1 109 926</td>
<td>579 371</td>
<td>200 259</td>
<td>34,6</td>
</tr>
<tr>
<td>2012</td>
<td>1 095 669</td>
<td>572 600</td>
<td>P</td>
<td>33,5</td>
</tr>
<tr>
<td>2013</td>
<td>1 084 397</td>
<td>559 631</td>
<td>178 373</td>
<td>Q</td>
</tr>
</tbody>
</table>

[Adapted from www.statssa.gov.za]

4.3.1 Identify the year during which the number of births was closest to 1,1 million.  

4.3.2 During which year was the total number of deaths the highest?  

4.3.3 Calculate the missing value:

(a) P  

(b) Q, rounded off to ONE decimal place  

4.3.4 Determine the number of deaths during 2013 that were NOT Aids-related.  

4.3.5 During which years, before 2012, was the percentage of Aids-related deaths exactly the same, but more than 40%?  

4.3.6 Name the years during which the number of births was greater than one million one hundred and eighteen thousand.  

4.3.7 Determine the ratio of the number of deaths to the number of births during 2011.  

[36]
QUESTION 5

5.1 Shaun needs to buy a new laptop for his daughter. The laptop costs R9 247,95 (VAT inclusive). He is considering taking out a personal loan.

He obtained the following personal loan payment table from Easy Loans:

**TABLE 5: Personal loan repayment table (21% interest per annum)**

<table>
<thead>
<tr>
<th>Loan amount</th>
<th>MONTHLY PAYMENT FOR DIFFERENT PERIODS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12 months</td>
</tr>
<tr>
<td>R4 000</td>
<td>R936,43</td>
</tr>
<tr>
<td>R10 000</td>
<td>R1 872,85</td>
</tr>
<tr>
<td>R20 000</td>
<td>R2 809,28</td>
</tr>
<tr>
<td>R30 000</td>
<td>R3 745,70</td>
</tr>
</tbody>
</table>

*The amounts shown above are approximate and will vary according to interest rate fluctuations.*

**NOTE:**
- The monthly payment excludes the monthly service fee of R75,00 and a monthly balance-protection insurance fee of R20,50.
- A once-off initiation fee of R350 is payable for new loans.

[Source: www.wfs.co.za]

5.1.1 Determine how much of his own funds he will have to use in order to buy the laptop if he takes a personal loan of only R4 000.  

5.1.2 Shaun eventually decides to take a personal loan of R10 000, repayable over three years.

Determine:

(a) The initiation fee as a percentage of the loan amount  

(b) The total monthly amount he will have to pay for this loan  

(c) The total interest he will pay for this loan
5.2 Shaun intends buying a new car. He investigates his possible monthly payments by using the online calculator for Absolute Bank’s Vehicle Finance as shown in the two examples below.

On-line Banking Calculators for Absolute Bank's Vehicle Finance:

[Diagram showing the online calculator for vehicle finance with cost of car, deposit/trade-in value, car finance required, interest rate, residual amount (R), residual amount (%), term of loan (months), initiation fee (once off), monthly service fee, and monthly repayment.

[Adapted from www.absa.co.za]

Use the on-line calculator examples above to answer the following:

5.2.1 Calculate the amount Shaun needs to borrow to buy the new car. (3)

5.2.2 The total monthly repayments for the loan over 36 months are R146 450,16. Show how this total was determined. (2)

5.2.3 Calculate the difference in the monthly repayments if he takes a loan over 36 months instead of 24 months. (3)
5.3 Marissa has a rectangular photo with dimensions of 5 inches × 7 inches.

She would like to frame the photo.

The inside dimensions of the rectangular frame as shown alongside is 10 cm × 15 cm.

5.3.1 Convert the dimensions of the photo to centimetres if
1 cm = 0.394 inches.

5.3.2 The photo does not fit exactly into the frame. Determine the minimum measure she will have to cut off from both the length and width of the photo so it can fit exactly into the frame.

5.4 TABLE 6 below shows the age and gender groups of registered voters for the 2014 South African national election.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Female</th>
<th>Male</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 to 19</td>
<td>351 555</td>
<td>297 686</td>
<td>649 241</td>
</tr>
<tr>
<td>20 to 29</td>
<td>3 099 266</td>
<td>2 661 566</td>
<td>3 102 434</td>
</tr>
<tr>
<td>30 to 39</td>
<td>3 220 425</td>
<td>2 953 490</td>
<td>6 173 915</td>
</tr>
<tr>
<td>40 to 49</td>
<td>2 690 374</td>
<td>2 309 110</td>
<td>4 999 484</td>
</tr>
<tr>
<td>50 to 59</td>
<td>2 107 405</td>
<td>1 680 275</td>
<td>3 787 680</td>
</tr>
<tr>
<td>60 to 69</td>
<td>1 297 809</td>
<td>959 228</td>
<td>2 257 037</td>
</tr>
<tr>
<td>70 to 79</td>
<td>738 443</td>
<td>416 302</td>
<td>1 154 745</td>
</tr>
<tr>
<td>80 +</td>
<td>419 257</td>
<td>160 003</td>
<td>579 260</td>
</tr>
<tr>
<td>TOTAL</td>
<td>13 924 534</td>
<td>11 437 660</td>
<td>25 362 194</td>
</tr>
</tbody>
</table>

(Source: www.elections.gov.za)

5.4.1 Write down the modal age group for the registered female voters.

5.4.2 Determine the following:

(a) The age group that had the least chance of having a voter from the group randomly selected for an interview on the day of voting

(b) The probability of randomly selecting a male voter in the 30 to 39 age group from all the registered voters. Give your answer as a decimal fraction.

TOTAL: 150
ANSWER SHEET

CENTRE NUMBER: [blank]

EXAMINATION NUMBER: [blank]

QUESTION 1.2.4

TABLE 1: Total income from the sale of fudge

<table>
<thead>
<tr>
<th>Number of blocks</th>
<th>0</th>
<th>4</th>
<th>10</th>
<th>B</th>
<th>20</th>
<th>24</th>
<th>36</th>
<th>50</th>
<th>54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total income (in rand)</td>
<td>0</td>
<td>10</td>
<td>25</td>
<td>30</td>
<td>50</td>
<td>60</td>
<td>90</td>
<td>125</td>
<td>135</td>
</tr>
</tbody>
</table>

Income and expenses for making one batch of fudge

![Graph showing income and expenses for making one batch of fudge]
## Annexure 1

### Question 1.1

**Salary Advice**

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Period</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMOYA High School</td>
<td>08</td>
<td>31/10/2013</td>
</tr>
</tbody>
</table>

**Name of Employee:** Mrs Eunice Mentoor  
**Identity Number:** 641028 0124 111  
**Employee Number:** 51111110

### Income

<table>
<thead>
<tr>
<th>Description</th>
<th>Hours</th>
<th>Hourly Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic salary</td>
<td>172.5</td>
<td>A</td>
<td>R7 452.00</td>
</tr>
<tr>
<td>Overtime worked</td>
<td>0</td>
<td>75.80</td>
<td>R 0.00</td>
</tr>
<tr>
<td>Mon.-Fri.</td>
<td>0</td>
<td>120.45</td>
<td>R 0.00</td>
</tr>
<tr>
<td>Saturdays</td>
<td>0</td>
<td></td>
<td>R 500.00</td>
</tr>
<tr>
<td>Housing allowance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Gross Salary:** R7 952.00

### Deductions

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAYE tax</td>
<td>R 393.00</td>
</tr>
<tr>
<td>UIF contributions</td>
<td>R 79.52</td>
</tr>
<tr>
<td>Pension fund contributions</td>
<td>R 596.40</td>
</tr>
</tbody>
</table>

**Total Deductions:** R1 068.92

**Taxable Salary:** R7 276.08

**Leave Days Due:** 18

**Nett Salary:** R6 883.08

<table>
<thead>
<tr>
<th>Total Gross Remuneration</th>
<th>Total PAYE Tax</th>
<th>Total Medical Aid Contributions</th>
<th>Total Pension Fund Contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>R63 616.00</td>
<td>R4 982.00</td>
<td>R0.00</td>
<td>R5 981.67</td>
</tr>
</tbody>
</table>

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ANNEXURE 2

QUESTION 3

= N6
The symbol for a national road

= R48
The symbol for a provincial road

= R701
The symbol for a regional road

[Source: www.aa.co.za]