



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

MATHEMATICAL LITERACY P2

NOVEMBER 2008

MARKS: 150

TIME: 3 hours

This question paper consists of 10 pages and 4 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of SIX questions. Answer ALL the questions.
2. QUESTIONS 3.4, 4.2.1 and 6.5.1 must be answered on the attached ANNEXURES. Write your examination number in the space provided on the annexures and hand in the annexures with your ANSWER BOOK.
3. Number the answers correctly according to the numbering system used in this question paper.
4. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
5. ALL the calculations must be shown clearly.
6. ALL the final answers must be rounded off to TWO decimal places, unless stated otherwise.
7. Start EACH question on a NEW page.
8. Write neatly and legibly.

QUESTION 1

Mr Abu of Amandla High School is the educator in charge of the English Olympiad.

He finds that the number of girls who enter the first round of the Olympiad is three times the number of boys who enter.

TABLE 1: Number of boys and girls entering the first round of the English Olympiad

| | | | |
|------------------------|----------|-----|----------|
| Number of boys | 3 | 50 | B |
| Number of girls | A | 150 | 180 |

- 1.1 Use the given information to determine the missing values **A** and **B** in TABLE 1. (4)
- 1.2 Suppose 2 550 boys entered the first round of the Olympiad. Calculate the total number of learners who entered for the first round of the Olympiad. (3)
- 1.3 Dina and Mpho wrote some Olympiad practice tests at school. Their marks, in percentages, are given in the table below.

TABLE 2: Percentage scored in practice tests

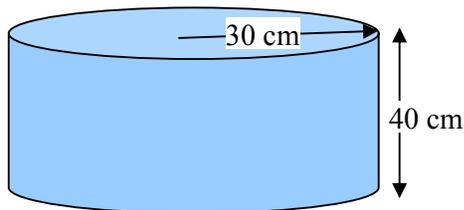
| | | | | | | | | | | |
|-------------|----|----|----|----|----|----|----|----|----|----|
| Dina | 48 | 48 | 48 | 53 | 58 | 62 | 70 | 72 | 80 | 86 |
| Mpho | 36 | 42 | 48 | 58 | 60 | 61 | 62 | 76 | 86 | |

- 1.3.1 Mpho's median mark is 60%. Calculate Dina's median mark. (2)
- 1.3.2 Dina's mean mark is 62,5%. Calculate Mpho's mean mark. (3)
- 1.3.3 Calculate the range of Dina's marks. (2)
- 1.3.4 Dina stated that she did better in her practice tests than Mpho. Give TWO reasons to support Dina's claim. (4)
- 1.4 Dina and Mpho both practise speed-reading in order to improve the time they spend reading texts.
- Mpho reads at a rate of two words per second.
 - Dina found that she can read two pages, with an average of 270 words per page, within three minutes.

Show by calculation whether Dina reads at a faster rate than Mpho. (5)
[23]

QUESTION 2

Thandi washes her dishes by hand three times daily in two identical cylindrical basins. She uses one basin for washing the dishes and the other for rinsing the dishes. Each basin has a radius of 30 cm and a depth of 40 cm, as shown in the diagram below.

**BASIN**

Thandi is considering buying a dishwasher that she will use to wash the dishes daily.

- 2.1 Calculate the volume of one cylindrical basin in cm^3 .

$$\text{Volume of a cylindrical basin} = \pi \times (\text{radius})^2 \times \text{height, using } \pi = 3,14 \quad (2)$$

- 2.2 Thandi fills each basin to half its capacity whenever she washes or rinses the dishes.

Calculate how much water (in litres) she will use daily to wash and rinse the dishes by hand. ($1\,000\text{ cm}^3 = 1\ell$) (5)

- 2.3 A manufacturer of a dishwasher claims that their dishwasher uses **nine times** less water in comparison to washing the same number of dishes by hand.

- 2.3.1 How much water would this dishwasher use to wash Thandi's dishes daily? (2)

- 2.3.2 Is the claim of the manufacturer realistic? Justify your answer by giving a reason(s). (3)

2.4 Thandi decides to buy a dishwasher based upon the advertisement below.

Come to **Best Buy Dealers** for the best deals in town.

BEST BUY DEALERS:

Dish Washer

Cash price: R2 699,00

OR

ONLY 10% deposit plus
24 equal monthly instalments
of **R177,53**

2.4.1 Suppose Thandi decides to buy the dishwasher using the instalment option.

(a) What is the balance owing after paying the deposit? (3)

(b) Calculate the total cost of the dishwasher. (4)

2.4.2 Suppose Thandi takes a loan from ABC Bank for the full cash price of the dishwasher. She is charged interest of 18% p.a. compounded monthly and agrees to repay the loan over two years in equal monthly instalments.

Use the formula $A = P(1+i)^n$ to calculate the total amount to be paid back, where:

A = total amount to be paid back

P = loan amount

i = monthly interest rate

n = number of months over which the loan will be taken

(6)

2.4.3 Which method of payment would you advise Thandi to choose? Give a reason for your answer. (3)

[28]

QUESTION 3

Mrs Maharaj makes duvet sets, which she sells at the local street market at R150,00 per set (including VAT).

- If she makes 50 or less duvet sets per month, her production costs are R100,00 per set.
- If she makes more than 50 duvet sets per month, her production costs are reduced by 15% per set.

Mrs Maharaj has to pay R8 400 annually for the rental of her stall and she has weekly transport costs of R75.

- 3.1 Mrs Maharaj prepares a monthly budget.
- 3.1.1 Show that her fixed cost for the month of February is R1 000,00. (2)
- 3.1.2 How does her fixed cost for February compare to her average monthly fixed costs? Show ALL calculations. (5)
- 3.2 Calculate the production cost per duvet set if 90 sets are made per month. (2)
- 3.3 The table below shows Mrs Maharaj's production cost for different quantities of duvet sets made in February.

TABLE 3: Cost of duvet sets made in February

| Number of duvet sets | 0 | 30 | 50 | 51 | 56 | 60 | 70 | D |
|--------------------------------|-------|-------|-------|-------|-------|-------|----|-------|
| Total cost per month (in rand) | 1 000 | 4 000 | 6 000 | 5 335 | 5 760 | 6 100 | C | 7 800 |

The formula used to calculate the total cost is:

$$\text{Total cost} = \text{fixed monthly cost} + (\text{number of duvet sets} \times \text{cost per set})$$

- Use the formula and the given information to determine the missing values **C** and **D**. (5)
- 3.4 Mrs Maharaj draws two graphs to represent her income and expenses for different quantities of duvet sets. The graph showing her INCOME for different quantities of duvet sets has already been drawn on ANNEXURE A.
- Use the values from TABLE 3 to draw a second graph on ANNEXURE A showing the total EXPENSES for February of making different quantities of duvet sets. Label the graph as 'EXPENSES'. (7)
- 3.5 Use the two graphs to answer the following questions:
- 3.5.1 How many duvet sets must Mrs Maharaj sell to break even? (2)
- 3.5.2 What profit will she make if all 80 duvet sets are sold? (3)
- 3.5.3 Suppose Mrs Maharaj makes 80 duvet sets, but only sells 70 of them. Calculate her profit for February. (3)

[29]

QUESTION 4

- 4.1

| |
|--|
| The provincial data on average annual incomes (in thousands of rand) and unemployment rates (as a percentage) are illustrated in the graphs represented on ANNEXURE B. |
|--|

Use the graphs to answer the questions below.

- 4.1.1 Calculate the difference in value between the average annual income for Gauteng and the Eastern Cape. (4)
- 4.1.2 What relationship, if any, exists between the unemployment rate and the average annual household income for the provinces? (2)
- 4.1.3 Give a valid reason why a person would choose to work in Gauteng rather than in the Eastern Cape. (2)
- 4.2 Lebo's family lives in the Eastern Cape. He now lives and works in Gauteng and earns a net salary of R10 625,00 per month. He sends home 35% of his net monthly salary every month and uses the rest for his own living expenses.
- Lebo's living expenses include the following:
- R3 500,00 per month for food and rental
 - R18,00 per day for transport (He works for 21 days every month.)
 - A cellphone contract of R135,00 per month
 - Clothing accounts of R250,00 a month
 - 10% of his net monthly salary for entertainment
- 4.2.1 Complete Lebo's monthly budget on ANNEXURE C. Show ALL the calculations on ANNEXURE C.
- (a) Calculate the amount he sends home every month.
Fill in the answer at **A**. (2)
- (b) Calculate the amount he has left for his own living expenses.
Fill in the answer at **B**. (1)
- (c) Calculate his total monthly living expenses.
Fill in the answer at **C**. (6)
- (d) Calculate the amount he has left after all his monthly living expenses have been paid.
Fill in the answer at **D**. (1)
- 4.2.2 He would also like to join a medical aid with a monthly contribution of R1 259,00 and a savings scheme with a contribution of R500,00 per month. Does he have enough money left each month for these extra expenses? Motivate and show ALL calculations. (4)
- [22]**

QUESTION 5

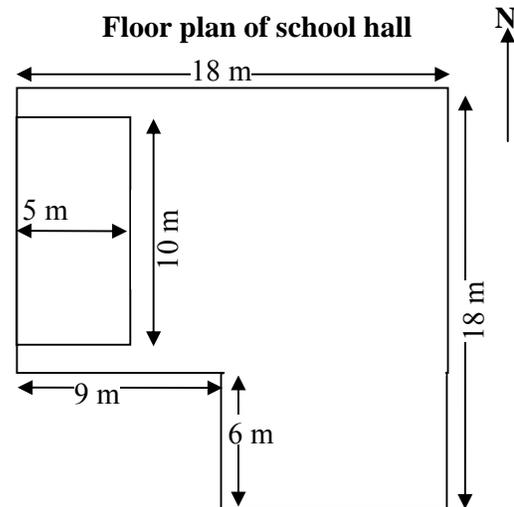
Naledi High School decides to tile the floor of their school hall using black and grey tiles.

The hall is L-shaped. A rectangular stage is located against one wall of the hall as illustrated in the sketch alongside.

The width of the stage is 5 m, and the length is 10 m.
The stage is not going to be tiled.

The size of a square tile is 50 cm by 50 cm.

The school needs to calculate how many tiles to buy.



5.1 A scale drawing is to be made of the hall.

Determine the scale (in simplified form) to be used if the length of the north wall of the hall is 60 mm. (2)

5.2 Calculate the area of the floor (excluding the stage) to be tiled.

(Area of a rectangle = length \times breadth) (8)

5.3 The tiler requires that 5% more tiles must be purchased to allow for cutting and breakages. Calculate how many tiles must be bought. (7)

5.4 The ratio of black tiles to grey tiles needed is 4:1. Tiles come in boxes of 12.

Calculate the number of full (complete) boxes of black tiles that must be bought. (4)
[21]

QUESTION 6

Jason Reed is a professional soccer player. In 2005 he negotiated a five-year contract with Shaya FC (Shaya Football Club).

Jason's starting salary with the club was R178 500 per year (excluding bonuses), with an assured salary increase of 5% per year.

The table below shows Jason's annual salary (excluding bonuses) for the first five years.

TABLE 4: Jason's annual salary

| YEAR | 2005 | 2006 | 2007 | 2008 | 2009 |
|------------------|---------|------|------------|------|------------|
| Salary (in rand) | 178 500 | ... | 196 796,25 | ... | 216 967,87 |

6.1 Calculate Jason's:

6.1.1 Annual salary for 2006 (2)

6.1.2 Total salary for the first five years (4)

6.2 During 2007 Shaya FC offered each player bonuses. They will give a player the following bonuses:

- R450 for each goal scored by the player
- R800 for each game won by the team

Shaya FC won 70% of the 30 games they played and Jason scored five goals during 2007.

6.2.1 Calculate the bonus earned by Jason for goals scored during 2007. (2)

6.2.2 Calculate the bonus earned by Jason for games won by the team during 2007. (2)

6.2.3 Hence, calculate Jason's total gross income (salary and bonuses) for 2007. (2)

6.3 With two years remaining on his contract, Jason receives an offer to play for an English football team. They offer him a net total salary of £36 960 over two years.

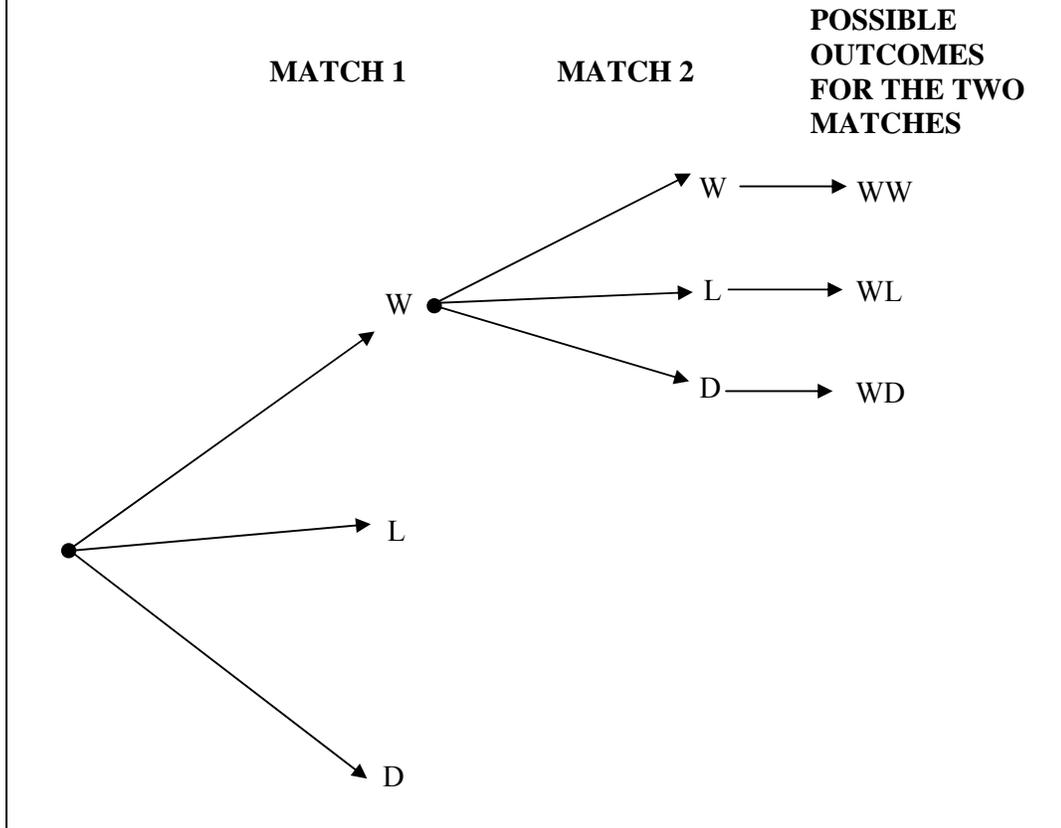
Calculate the difference between the net salary, in rand, he would earn in 2009 if he accepts the overseas offer.

(Use the exchange rate of £1 = R16,45.) (4)

6.4

Shaya FC plays two matches in March. There are three possible outcomes for each match: win (W), lose (L) or draw (D).

A tree diagram is drawn to work out the possible outcomes for the two matches.



6.4.1 The incomplete tree diagram above has also been provided on ANNEXURE D.

Complete the tree diagram on ANNEXURE D to show all the possible outcomes of the two matches. (4)

6.4.2 Use the completed tree diagram to predict the probability that Shaya FC will:

- (a) Win both matches (2)
 - (b) Win only one of the matches (2)
 - (c) Draw at least one of the matches (3)
- [27]

TOTAL: 150

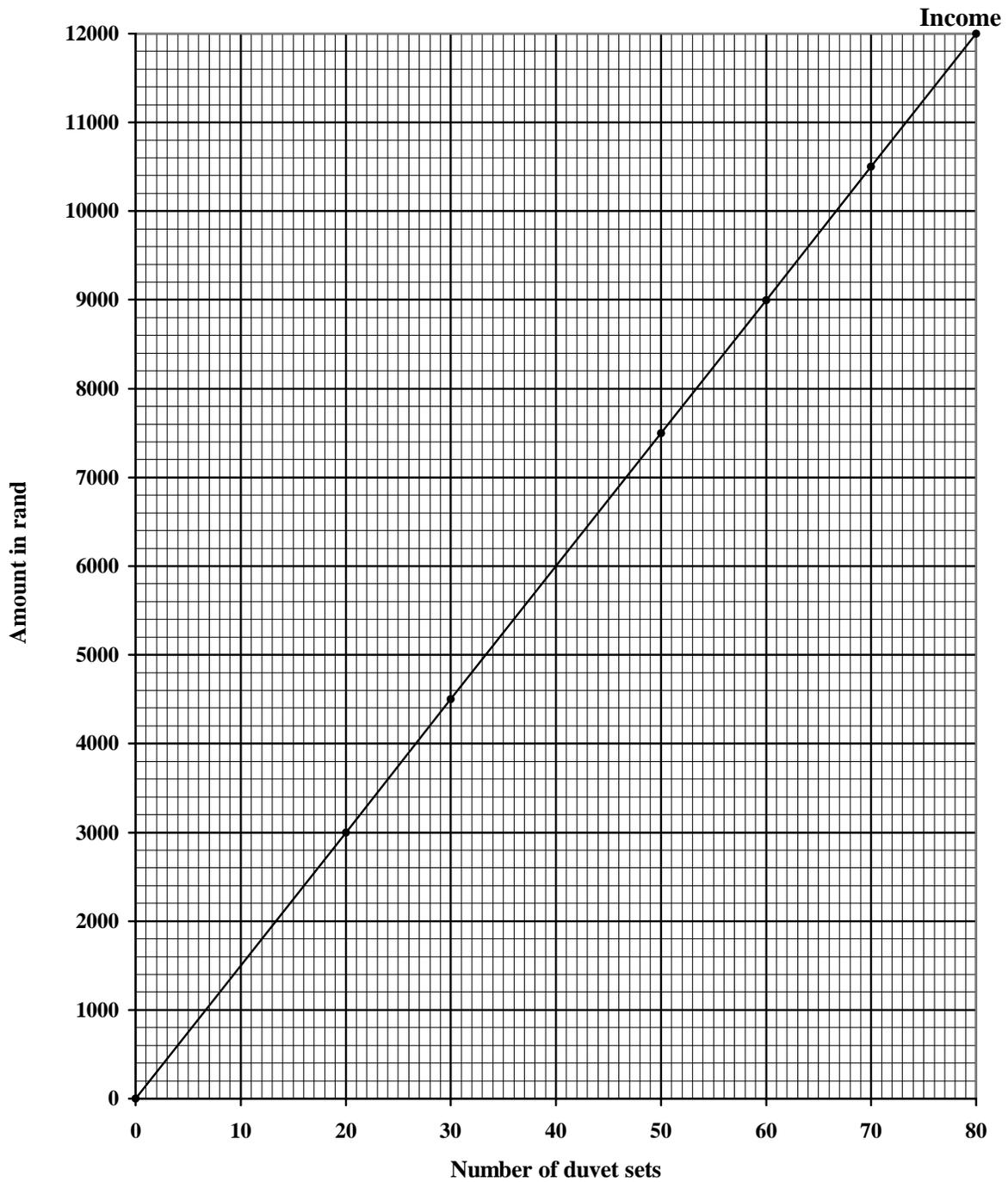
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ANNEXURE A

QUESTION 3.4

INCOME AND EXPENSES

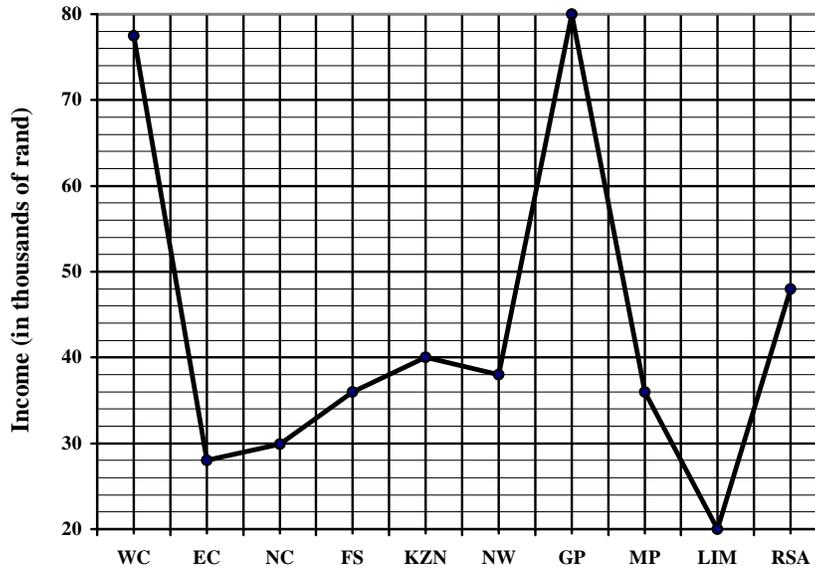


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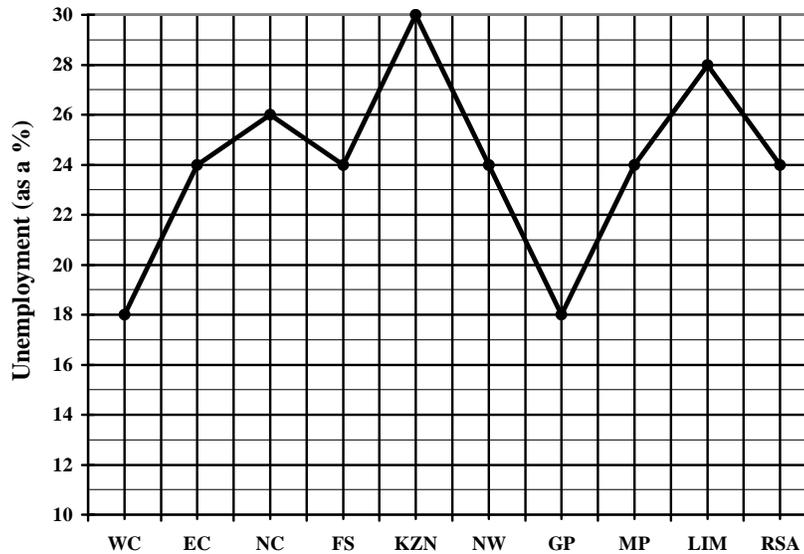
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ANNEXURE B

PROVINCIAL DATA ON AVERAGE ANNUAL INCOME



PROVINCIAL DATA ON UNEMPLOYMENT RATES



KEY:

| | | |
|--------------------|---------------------|-----------------------------|
| WC = Western Cape | KZN = KwaZulu-Natal | MP = Mpumalanga |
| EC = Eastern Cape | NW = North West | LIM = Limpopo |
| NC = Northern Cape | GP = Gauteng | RSA = whole of South Africa |
| FS = Free State | | |

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ANNEXURE C

QUESTION 4.2.1

| LEBO'S MONTHLY BUDGET | | | |
|-----------------------------------|----------|----------|----------|
| | | R | c |
| Net salary | | | |
| Amount sent home | A | | |
| Amount for living expenses | B | | |
| LIVING EXPENSES | | | |
| Food and rental | | | |
| Transport | | | |
| Cellphone contract | | | |
| Clothing account | | | |
| Entertainment | | | |
| TOTAL LIVING EXPENSES: | C | | |
| AMOUNT REMAINING: | | | |
| | D | | |

EXAMINATION NUMBER:

| | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
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ANNEXURE D

QUESTION 6.5.1

