

**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY

(Second Paper)

NQF LEVEL 4

NOVEMBER 2011

(10401034)

9 November (Y-Paper)

13:00 – 16:00

Drawing instruments may be used.

Calculators may be used.

This question paper consists of 12 pages and 1 ANNEXURE.



TIME: 3 HOURS
MARKS: 150

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
 2. Read ALL the questions carefully.
 3. Number the answers according to the numbering system used in this question paper.
 4. Clearly show ALL calculations, diagrams, graphs, et cetera you have used in determining the answers.
 5. An approved calculator may be used, unless otherwise stated.
 6. Drawing instruments including rulers, pairs of compasses and protractors may be used.
 7. Diagrams are not necessarily drawn to scale.
 8. Write neatly and legibly.
-



QUESTION 1

1.1 Mr Smith wants to buy a new car, preferably a Toyota.

The table below shows the model and colour of 20 cars that are available at a Toyota dealer in his home town:

Choice of model and colour of car		Colour of car				Total
		White	Metallic blue	Metallic green	Silver	
Model of Car	Verso	5	2	1	2	A
	Auris	2	1	B	2	6
	Corolla	1	C	1	1	4
	Total	8	4	3	5	20

- 1.1.1 Complete the table by writing down the values for A, B and C. Please note that you are not required to copy the table. (3)
- 1.1.2 What is the probability that Mr Smith will purchase a white Toyota? Write the probability in decimal form. (3)
- 1.1.3 What is the probability that Mr Smith will purchase a Corolla? Write the probability as a percentage. (3)
- 1.1.4 If Mr. Smith wants to buy a metallic blue car, what is the probability that he would buy a metallic blue Verso. (3)



- 1.2 Mr Smith read the following advertisement in the Sunday Times. Study the information in the advertisement below and use it to answer the questions that follow.

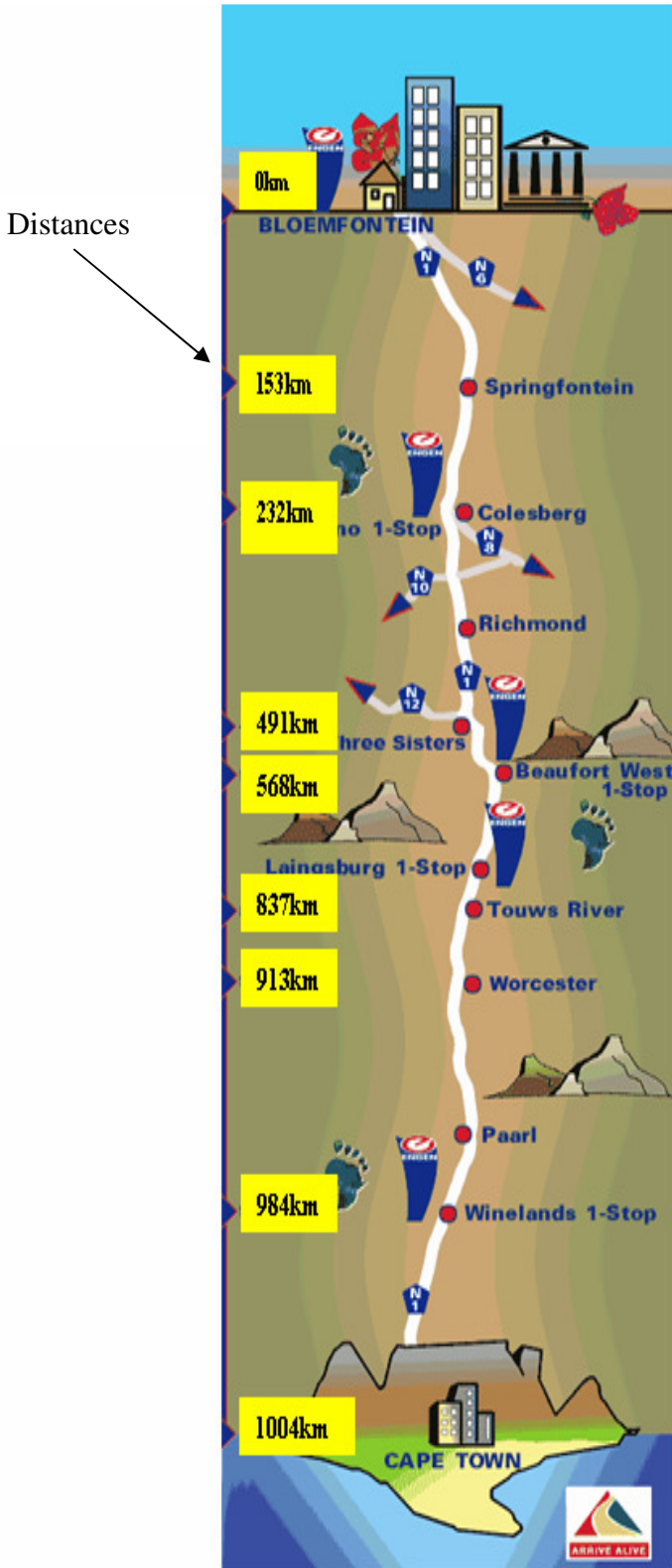
Get the deal that suits your lifestyle and your pocket



Model	Price VAT included	Deposit	Number of instalments	Monthly instalment *	Final Balloon payment **	Total Instalments
Corolla	R 180 400	R 18 040	60	R 2 287	R 63 140	R 137 220
Auris	R 182 000	R 21 840	60	R 2 429	R 63 700	R 145 740
Verso	R 244 400	R 24 440	60	R 3 325	R 85 540	R 199 500
* Initiation fee and monthly administration fee included.						
** Amount owing after making all monthly payments.						
VAT – Value Added Tax						

- 1.2.1 Write the deposit required to purchase the Auris as a percentage. (3)
- 1.2.2 If Mr Smith decides to buy a Verso on an instalment plan, show by calculation that the total amount that he will repay is R 309 480.
- Formula:
 Total repayment = deposit + Total instalments + Final balloon payment (4)
- 1.2.3 Mr Smith decides to buy the Verso according to the terms of the above advertisement. Determine how much Mr Smith would have saved if he bought the car for cash. (2)
- 1.2.4 State one disadvantage of purchasing a vehicle through bank finance. (1)

1.3 Mr Smith lives with his family in Bloemfontein. He decides to take his family on a vacation to Cape Town with the new vehicle. A strip map of the route joining Bloemfontein to Cape Town is given below. Use the map to answer the questions that follow:



1.3.1 Determine the distance between Colesburg and Touws River. (3)

1.3.2 The new car has a petrol consumption of 14 litres per 100 km and the petrol cost is R 9,15 per litre. Calculate the amount that Mr Smith will spend on petrol to complete the journey. (5)

1.3.3 Mr Smith decides to break the journey by stopping overnight at Beaufort West. If he travels at an average speed of 90 km/h, determine the time it will take the family to reach Beaufort West. Round off your answer to the nearest hour.

Formula: $\text{Time} = \frac{\text{distance}}{\text{speed}}$ (5)

- 1.4 Sylvia purchased a new flat at a price of R290 000.
 She paid a 30% deposit. The bank grants her a loan for the balance.
 The bank offers her an interest rate of 9% per annum for a period of 20 years.

Given below is the table Sylvia uses to calculate her monthly repayment for the loan.

Monthly repayment per R1 000 of a home loan			
Interest Rate	8%	9%	10%
20 years	R 8, 43	R 10, 15	R 10,70
25 years	R 7,79	R 9, 89	R 10, 14

Use the information and the table to answer the questions that follow.

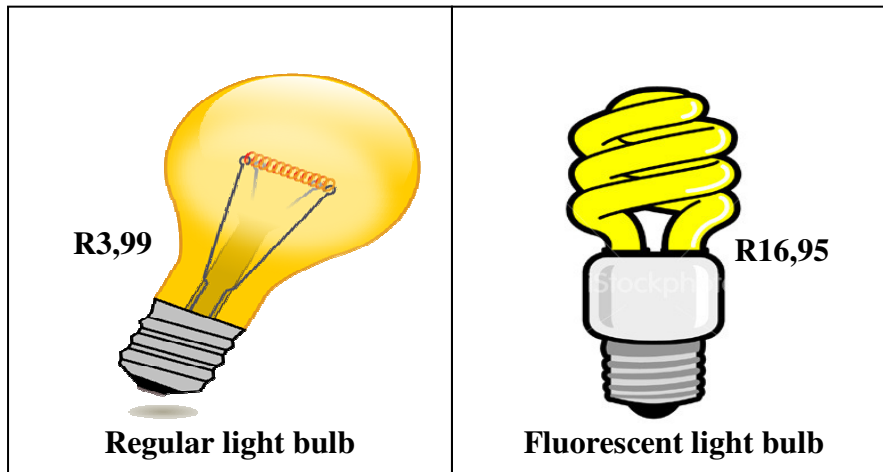
- 1.4.1 Show by calculation that Sylvia's monthly instalment will be R2 060, 45. (5)
- 1.4.2 Calculate the total cost of the flat if Sylvia pays off the loan in 20 years. (5)
- 1.4.3 Calculate the interest that Sylvia will pay towards the loan over 20 years. (4)

[49]



QUESTION 2

Eskom has embarked on an awareness campaign to show consumers how to conserve electricity and save money. They claim that fluorescent light bulbs use **one-quarter the amount of electricity and last eight times longer** than regular light bulbs. However a fluorescent light bulb costs more than a regular light bulb.



Use the information above to answer the following questions:

- 2.1 If a fluorescent light bulb uses 15 W of electricity per hour, how many kilowatts does a regular light bulb use in one hour?

Note: 1 kW = 1 000 W

(3)

- 2.2 If Eskom charges 65,35c per kWh and a fluorescent light bulb uses 15 W of electricity per hour. Show that the hourly running cost of using a fluorescent bulb in rand and cents, rounded off to the nearest cent is R0,01.

Formula: Hourly running cost = kW/h \times c/kWh

(4)

- 2.3 The table below shows the total cost of using a fluorescent light bulb and a regular light bulb. Study the table and answer the question that follows.

Type of light bulb	Fixed cost	Running Cost per kWh/hour	Total cost = fixed cost + running cost			
			0 hours	50 hours	100 hours	150 hours
Fluorescent	R 16,95	R0,01	R16,95	R17,45	A	R18,45
Regular	R 3,99	R0,04	R3, 99	R5,99	R7,99	B

Use the table to calculate the values of A and B.

(4)

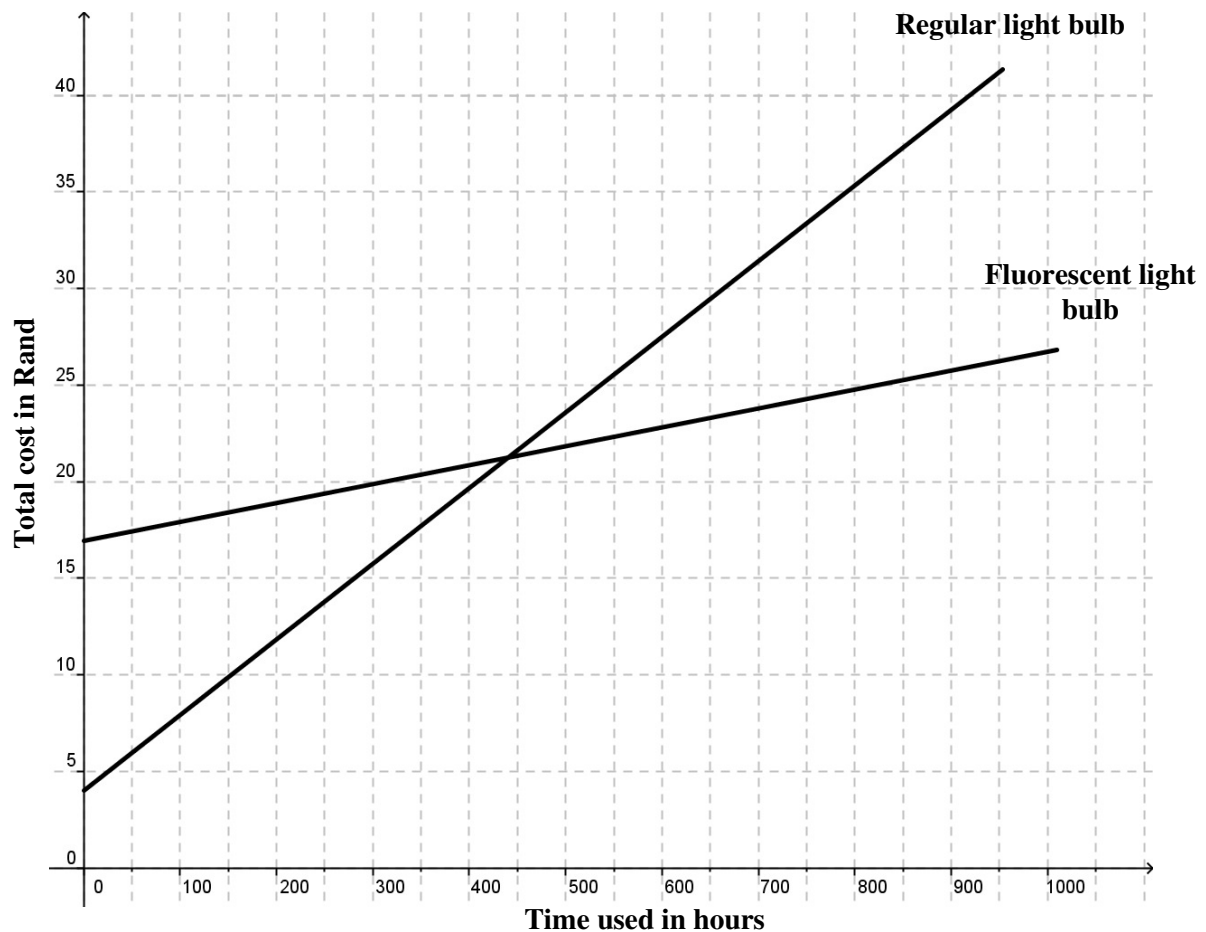
- 2.4 The formula to determine the total cost using a regular light bulb is:

Total cost = R3,99 + R0,04 \times number of hours used.

Write down the formula for determining the total cost of a fluorescent bulb.

(2)

2.5 The graph below compares the total cost of burning the two bulbs:



Use the graph to answer the following questions:

- 2.5.1 Why does one graph start at R16, 95 and the other at R3, 99 although no time has elapsed? (2)
- 2.5.2 After how many hours do the graphs break even? (2)
- 2.5.3 Calculate how much you would have saved after 600 hours by using a fluorescent instead of a regular light bulb. Show all your calculations. (3)
- 2.5.4 Calculate how much you would have saved after 1 100 hours by using a fluorescent instead of a regular light bulb. (5)
- 2.6 Does the early rounding off of the running cost per kWh have a significant impact on:
- 2.6.1 the cost for the consumer? (Yes/No. Motivate your choice) (2)
- 2.6.2 the income for the municipality? (Yes/No. Motivate your choice) (2)

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QUESTION 3

- 3.1 The salary advice of Mr Thabo Langa is given below. Study it and answer the questions that follow

MYSTEEL INDUSTRIES (PTY) LTD. SALARY ADVICE				
EMPLOYEE NAME			January 2011	
T Langa			Date of payment	25.01.2011
			Tax number	05434415
			Dependants	3
			Bank	Best Bank
			Account No	2870198
EARNINGS			DEDUCTIONS	
Description	Taxable	Payable	Description	Amount
Basic Salary	R 15 771,93	R 15 771,93	Insurance	R 389,61
Taxable (medical)	R 470,33	R 0,00	UIF	R 88,36
Taxable (car allowance)	R 1 585,42	R 0,00	Funeral premium	R 8,61
			Lifestyle premium	R 82,00
			Insurance: spouse	R 125,33
			Union membership	R 18,00
			Income tax (PAYE)	R 2 785,67
GROSS INCOME	R 17 827,68	R 15 771,93	TOTAL DEDUCTIONS	R 3 497,58
			NET INCOME:	R xxxxxxx

- 3.1.1 Calculate Mr Langa's net income. (3)
- 3.1.2 Mr Langa gets a 12% increase on his salary in July 2011. What will his basic salary be at the end of July 2011? (3)
- 3.1.3 What percentage is the UIF (Unemployment Insurance Fund) of Mr Langa's basic taxable salary? (3)



- 3.2 The latest tax rates table from SARS is given below. Use the information in the tax table to answer the questions that follow.

INCOME TAX: INDIVIDUALS AND TRUSTS	
Tax rates (year of assessment ending 29 February 2011)	
Individuals and special trusts	
Taxable Income (R)	Rate of Tax (R)
0 – 150 000	18% of taxable income
150 001 – 235 000	27 000 + 25% of taxable income above 150 000
235 001 – 325 000	48 250 + 30% of taxable income above 235 000
325 001 – 455 000	72 250 + 35% of taxable income above 325 000
455 001 – 580 000	120 750 + 38% of taxable income above 455 000
580 001 and above	168 250 + 40% of taxable income above 580 000
Tax Rebates	
Rebates	
Primary	R10 755
Secondary (Persons 65 and older)	R 6 012
Tertiary (Persons 75 and older)	R 2 000
Tax Thresholds	
Age	Tax threshold
Below age 65	R 59 750
Age 65 to below 75	R 93 150
Age 75 and over	R104 261
<i>Source: SARS website</i>	

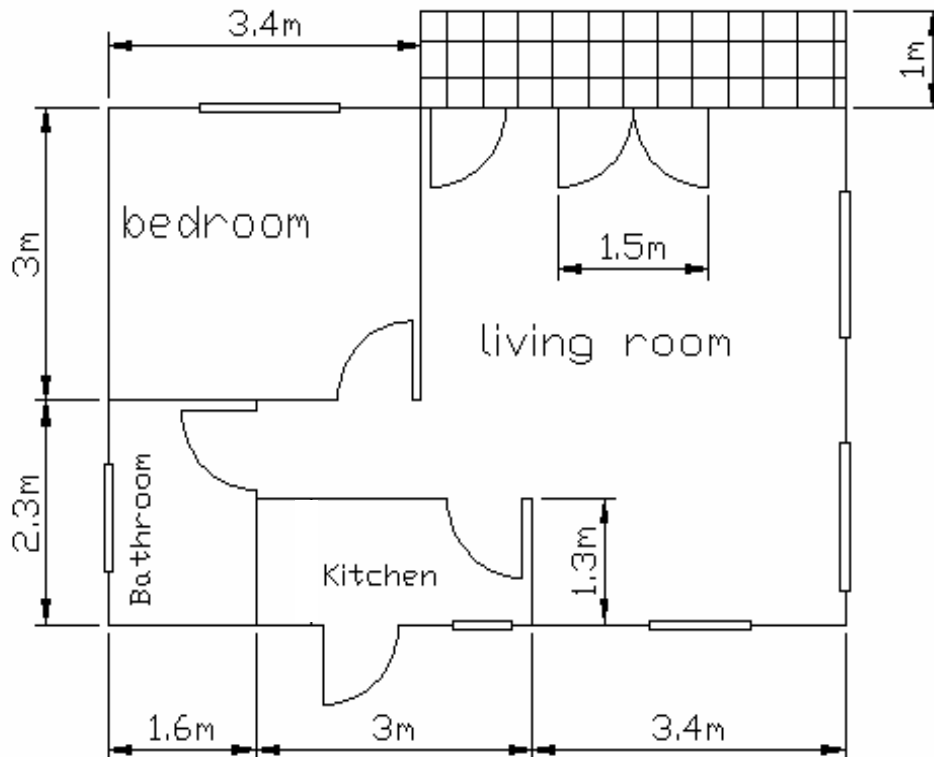
- 3.2.1 Mr Langa is a 55-year-old man who earns a gross taxable income of R 17827, 68. Use the tax table to prove that the tax Mr Langa should pay on his gross taxable income is R32 228,04. (9)
- 3.2.2 According to Mr Langa's salary advice, he paid R2 785,67 per month towards income tax (PAYE). Use the answer in QUESTION 3.2.1 to determine the amount that Mr Langa owes SARS or the amount that is due to him by SARS. (5)

[23]



QUESTION 4

Given below is the floor plan of the flat that Sylvia bought:



- 4.1 What is the scale used in the floor plan? Your answer must be in the following format:
millimetres : metre (2)
- 4.2 Calculate the total area of the flat, excluding the patio.
Formula: $\text{Area} = l \times b$ (4)
- 4.3 Sylvia paid R 290 000 for the flat, calculate the amount she paid per square metre for the flat, including the patio. (6)
- 4.4 Sylvia placed a wardrobe with dimensions 1 200 mm by 800 mm and a bed with dimensions 1,9 m by 1,1 m in the bedroom:
- 4.4.1 Calculate the area of the bedroom floor space that is left, after the bed and wardrobe is placed into the bedroom. Your answer must be in m^2 . (6)
- 4.4.2 Sylvia bought carpet at R 165/ m^2 and the total labour cost for carpeting the bedroom is R 400. Calculate the total cost of carpeting the total area of the bedroom. (4)
- 4.5 Sylvia wants to tile the kitchen and bathroom floors. The total cost of tiling is R 140/ m^2 . Calculate the total cost of tiling the kitchen and bathroom. (4)

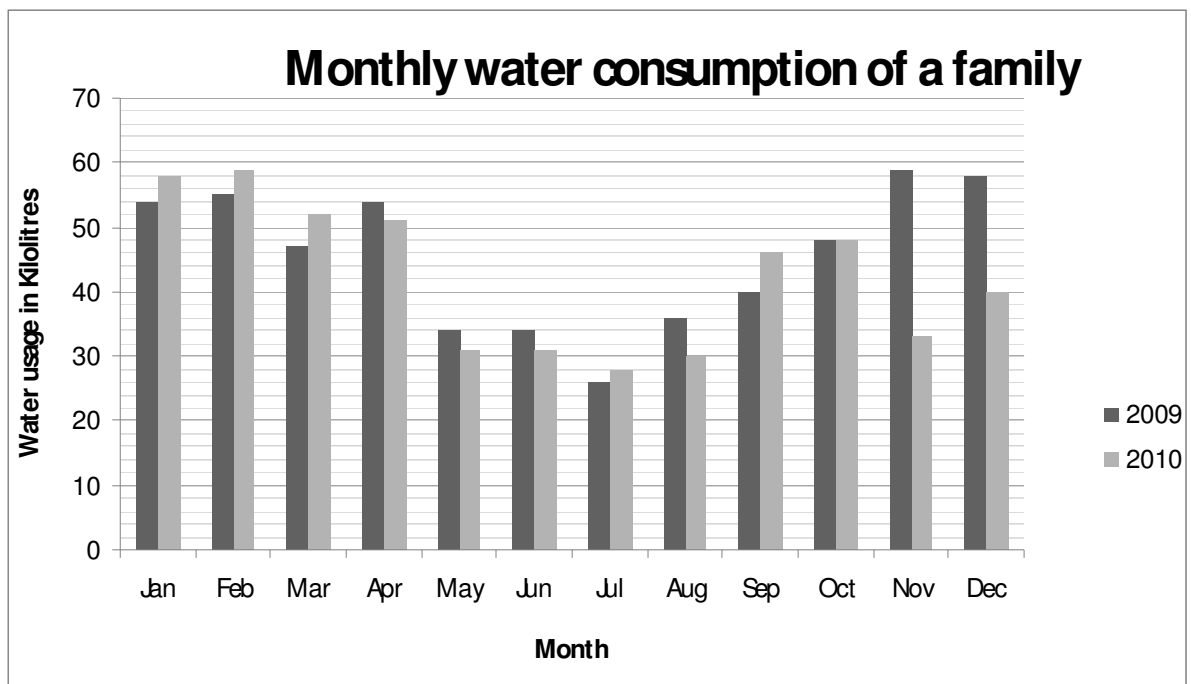
[26]

QUESTION 5

The following table refers to the monthly water consumption tariffs of a Municipality:

Monthly tariffs for water consumption (used) by a household in 2009						
Level	1	2	3	4	5	6
Kilolitres	0 – 6	7 – 12	13 – 20	21 – 40	41 – 60	60 +
Cost (R/kl)	Free	R2, 12	R5, 15	R10, 20	R13,34	R16,30

The double bar graph below, represents the monthly water consumption of a family for the years 2009 and 2010:



Use the tariff table and the graph to answer the questions that follow:

- 5.1 How much of water was consumed (used) by the family during the first six months of 2009? (3)
- 5.2 Use the tariff table to calculate the cost of water used for July 2009. Complete the table on ANNEXURE A. (6)
- 5.3 Use the tariff table to calculate the cost of water used for February 2010. The tariffs increase by 5,5% from 2009 to 2010. (8)
- 5.4 Why do you think that the water consumption (usage) is lower during the middle of the year? (2)
- 5.5 Describe the trend of the water consumption of this family during the months of November and December, from 2009 to 2010. Justify your answer by giving one possible reason for the trend. (4)

[23]**TOTAL: 150**

ANNEXURE A

EXAMINATION NUMBER:

QUESTION 5.2

Level	Kl range	Kl used per range	Charged per range per Kl	Cost
1	0-6	6 kl	Free	
2	7-12		R2,12	
3	13-20		R5,15	
4	21-40		R10,20	
5	41-60		R13,34	
6	60+		R16,30	
	TOTAL			

