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NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2023

MATHEMATICAL LITERACY: PAPER I

EXAMINATION NUMBER

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Time: 3 hours

150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of:
 - 24 pages that include 2 pages at the back for extra calculations or rough work.
 - Five questions
2. Please check that your question paper is complete.
3. Answer ALL FIVE questions.
4. **Answer ALL the questions on the question paper and hand this in at the end of the examination. Remember to write your examination number in the space provided.**
5. A non-graphical, non-programmable calculator may be used.
6. ALL necessary calculations must be clearly shown.
7. Units of measurement must be included where applicable.
8. It is in your own interest to write legibly and to present your work neatly.
9. Maps and diagrams are not necessarily drawn to scale.
10. TWO blank pages (pages 23–24) are included at the end of the question paper. If you run out of space for a question, use these pages. Clearly indicate the question number of your answer should you use this extra space.

Question	1		2		3		4		5		Total	
	Marker	Mod.	Marker	Mod.	Marker	Mod.	Marker	Mod.	Marker	Mod.	Marker	Mod.
Mark												
Signature												
Total	32		37		26		29		26		150	

QUESTION 1

- 1.1 The following document is an extract from the Republic of South Africa's national budget for 2022/2023. It shows the revenue sources for the Republic of South Africa.

South Africa National Budget Revenue 2022/2023	
Rand values are in billions	
Tax revenue sources	R1 598,4
of which:	
Personal income tax	R687,9
Corporate income tax	R308,3
Value-added tax	R539,7
Taxes on international trade and transactions	R62,5
Non-tax revenue sources	R33,3
Less: SACU payments	–R43,7
Main budget revenue sources	R1588,0
Provinces, social security funds and public entities	R182,6
Consolidated budget revenue sources	R1770,6
As percentage of GDP	
Tax revenue	24,8%
Main budget revenue	24,7%

[Adapted from: South Africa budget review.pdf]

Use the above information to answer the questions that follow.

- 1.1.1 State the difference between a budget and an income and expenditure statement.

(2)

- 1.1.2 Identify, as a percentage of the GDP, which of the consolidated budget's revenue sources is lower.

(2)

- 1.1.3 Name two sources of tax revenue listed in this budget.

(2)

- 1.1.4 Show, using calculations, how the total of R1 598,4 for tax revenue was calculated.

(2)

- 1.1.5 An amount –R43,7 appears with a minus sign in the amount column. State the importance of the minus sign.

(2)

- 1.1.6 Write out the value of the main budget revenue sources in full, without using commas or words.

(2)

- 1.1.7 Write down, in words, the amount in full for non-tax revenue.

(2)

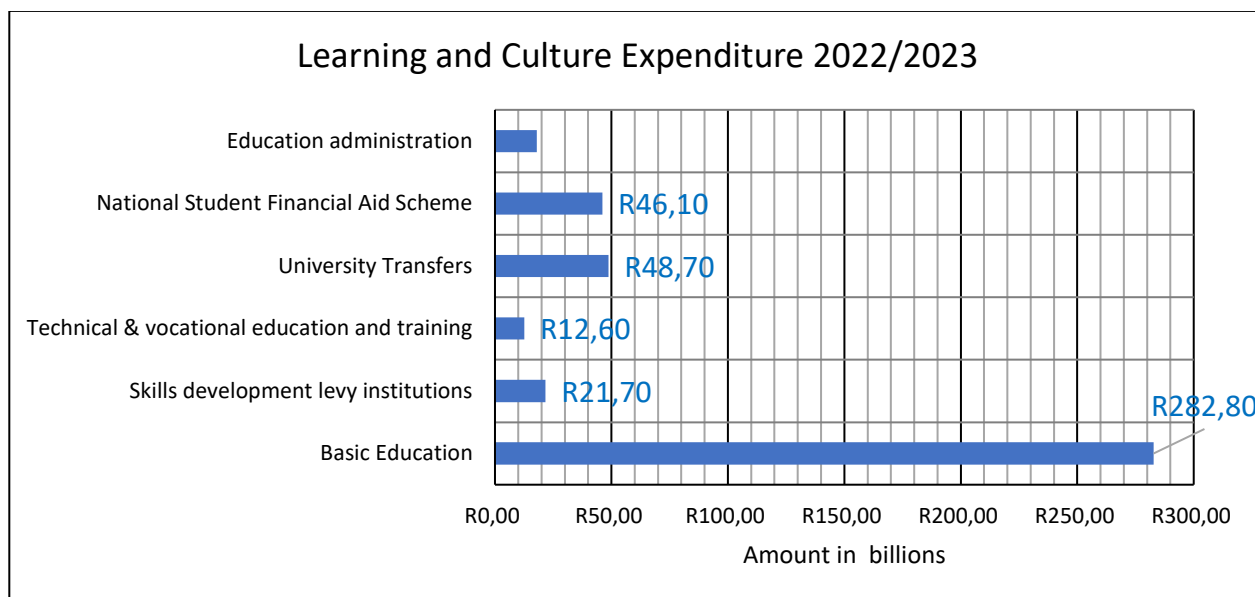
- 1.1.8 (a) Convert the given tax revenue percentage to a decimal number.

(2)

- (b) Give the acronym for Value-added tax.

(2)

- 1.2 The graph below shows the Learning and Culture Expenditure for the Republic of South Africa for 2022/2023. The total expenditure for Learning and Culture was R430,9 billion. The graph below shows the various sectors of learning and culture expenditure for 2022/2023.



[Adapted from: South Africa budget review.pdf]

Use the above information and graph to answer the questions that follow.

- 1.2.1 List the sector that spent the least amount of the total learning and culture budget.

(2)

- 1.2.2 Determine how much was spent on the skills development levy institutions sector.

(2)

- 1.2.3 Name another graph that can be used to represent the above data.

(2)

- 1.2.4 Calculate the percentage of the total Learning and Culture Expenditure that is spent on Basic Education.

(2)

- 1.2.5 State which sector spent the second-largest amount of the Learning and Culture Expenditure budget.

(2)

- 1.2.6 Determine the missing amount for the Education administration sector.

(2)

- 1.2.7 Arrange the given data values in descending order of values.

(2)
[32]

QUESTION 2

Nike Incorporation, formerly Blue Ribbon Sports, is an American sportswear company with its headquarters in Beaverton, Oregon. Nike was founded in January 1964 and has grown to become one of the world's largest suppliers of athletic shoes and apparel.

- 2.1 The 'Nike Air Jordan 1 Retro High Tie Dye' is a popular Nike shoe. An online store advertised them on a Christmas special from 23 December 2022 to 6 January 2023 as shown below.



CHRISTMAS SALE NOW ON!

**Jordan 1
Retro Tie
Dye**

R1,499.00 ~~R2,299.00~~

[Source: <<https://welleofficial.co.za/products/jordan-1-retro-tie-dye>>]

Use the above information to answer the questions that follow.

- 2.1.1 (a) Calculate the total number of years Nike has been in business. Round your answer to the nearest year.

(2)

- (b) Determine the total number of days this Christmas special was on for.

(2)

- 2.1.2 Calculate the amount of discount offered on these shoes.

(2)

- 2.1.3 Calculate the percentage discount you would receive if you were to purchase these shoes during the advertised special.

(3)

- 2.1.4 Calculate the amount of VAT on the discounted price of R1 499 including VAT.

(3)

- 2.1.5 (a) Use the given exchange rate to convert R1 499 into US dollars. Round off your answer to two decimal places.

\$1: R17,006289

(3)

- (b) Explain why currency exchange rates are often written with many decimal digits.

(2)

- 2.2 A Mathematical Literacy learner in matric collected the following data from her peers at school. The data set shows the shoe sizes and heights of female students.

Shoe Size	Height (cm)
6	152
7	169
8	174
4	170
8	177
5	158
10	183
8	170
12	188
6	162
9	180

Use the above information to answer the questions that follow.

- 2.2.1 Determine the median shoe size for this data set.

(2)

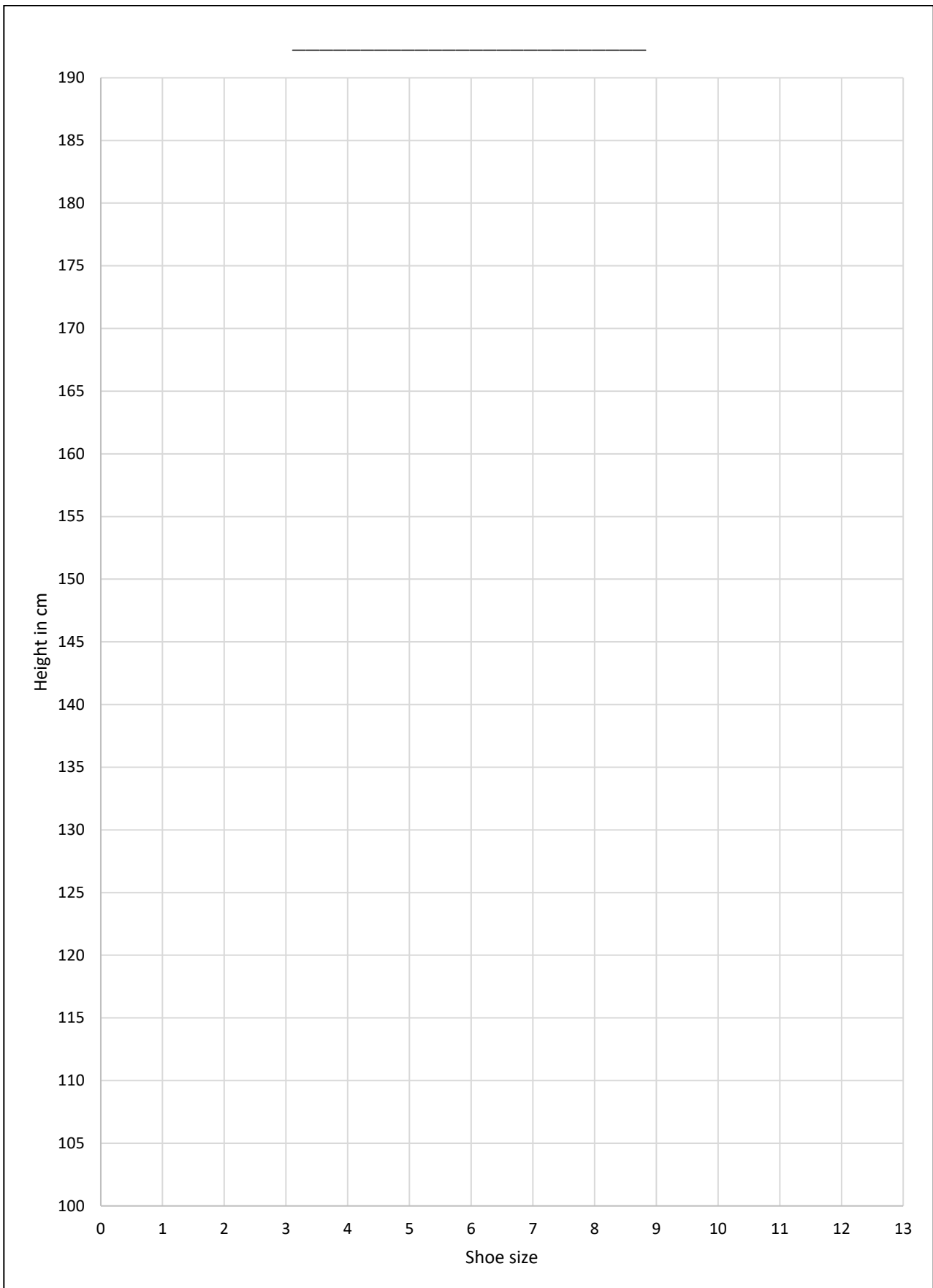
- 2.2.2 Write down the modal shoe size for this data set.

(2)

- 2.2.3 Determine the range for the heights in this data set.

(2)

2.2.4 Use the given data to draw a scatter graph (scatter plot) on the grid below.



(8)

2.2.5 Describe an observable trend in your scatter graph.

(2)

2.2.6 (a) Define an outlier in a data set.

(2)

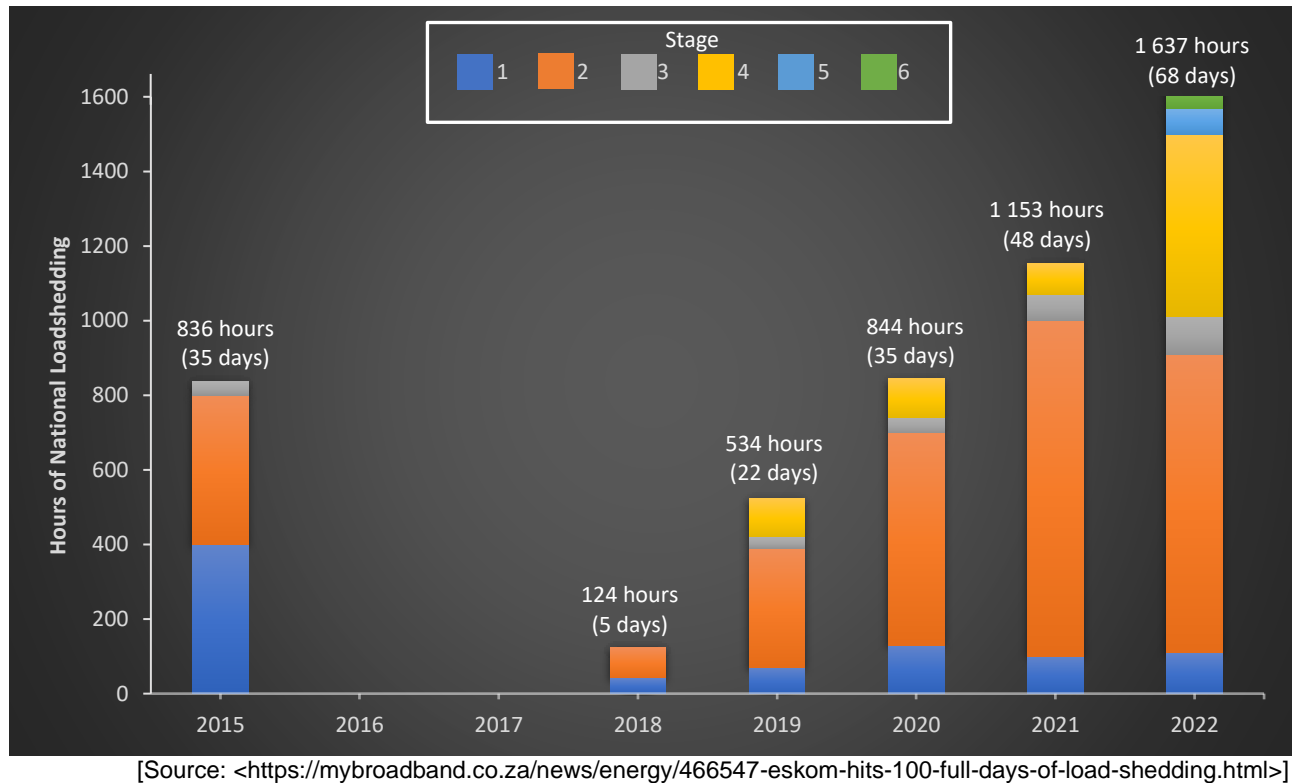
(b) Identify a possible outlier in this data set. Give the shoe size and corresponding height.

(2)
[37]

QUESTION 3

Loadshedding has been a major national crisis in South Africa for several years.

- 3.1 The following stacked bar graph shows the number of hours for each stage of loadshedding from 2015–2022.



Use the above information to answer the questions that follow.

- 3.1.1 Determine how many hours of Stage 2 loadshedding occurred in 2015.

(2)

- 3.1.2 Show, using calculations, how the 48 days of loadshedding was calculated for 2021.

(2)

- 3.1.3 Calculate the percentage increase in the number of hours of loadshedding from 2018 to 2022.

$$\text{Percentage increase} = \frac{\text{New value} - \text{Old value}}{\text{Old value}} \times 100\%$$

(4)

- 3.1.4 Give ONE possible reason why there are no bars drawn for the years 2016 and 2017.

(2)

- 3.2 Francois Nel, a homeowner, was looking at ways to reduce the impact of loadshedding. He purchased the following home loadshedding kit from a retail store on a hire purchase agreement over three years.

Loadshedding Kit

Cash Price

R44 956,52 excluding VAT

or

Hire Purchase

Deposit of 10% of cash price (including VAT)

3 years
(with equal monthly instalments)

Interest rate of 8% p.a.



[Source: <<https://leroymerlin.co.za/solar-sys-230v-5kva-4-8kw-backup-system-81463380>>]

Use the above information to answer the questions that follow.

- 3.2.1 Using calculations, show that the cash price, including VAT, is R51 700.

(2)

3.2.2 Calculate the loan amount, including VAT, for the hire purchase agreement.

$$\text{Loan Amount} = \text{Cash Price} - \text{Deposit Value}$$

(3)

3.2.3 (a) Calculate the total cost of the loan if this loadshedding kit was purchased on hire purchase.

(4)

(b) Calculate the monthly instalment that Francois Nel would pay if this kit was purchased on hire purchase.

(3)

3.2.4 Calculate the amount Francois Nel would have saved if he purchased the kit for cash instead of the hire purchase agreement.

(2)

3.2.5 Give another legal way that Francois Nel could finance this loadshedding kit instead of the hire purchase agreement.

(2)

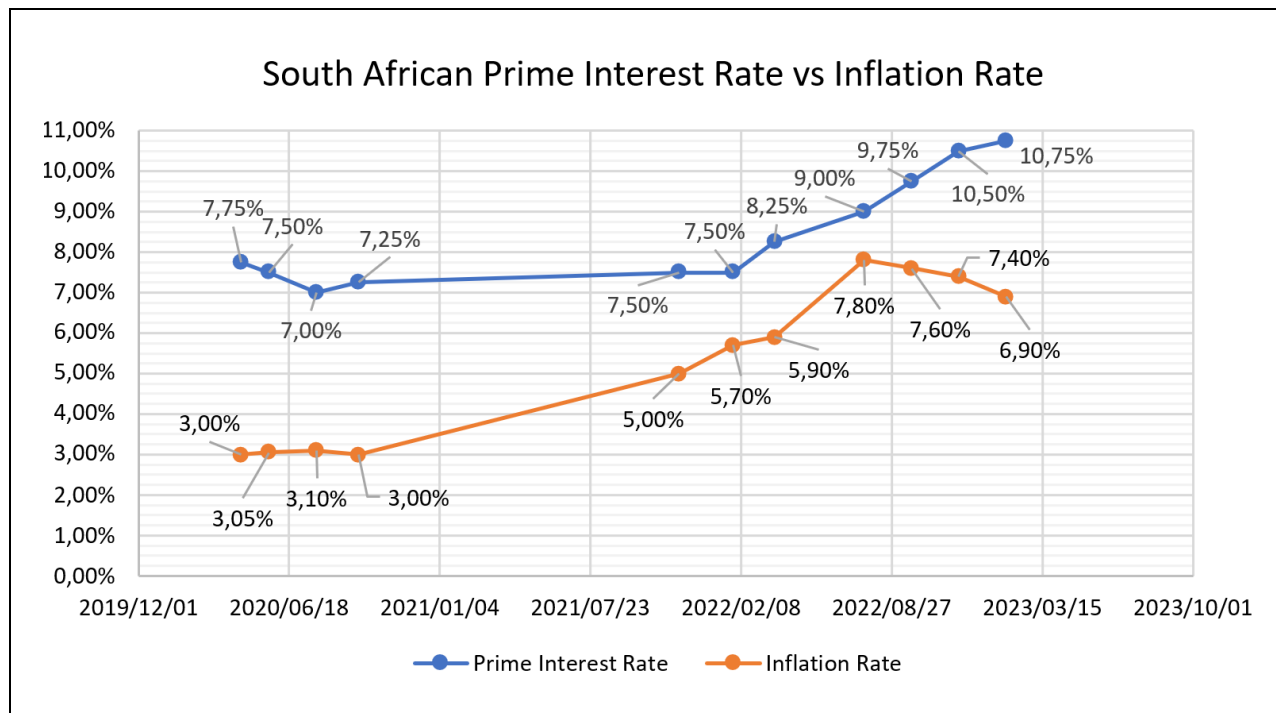
[26]

QUESTION 4

The South African Reserve Bank was forced to increase the prime interest rate* over the last two years.

* Also known as the prime lending rate, it is the basic or default interest rate that you could be charged when borrowing for big purchases such as a home or a car.

- 4.1 The main reason for the South African Reserve Bank increasing the prime lending rate is to control inflation. The graph below shows the change in the prime interest rate and the inflation rate over the last couple of years.



[Adapted from: <<https://www.news24.com/drum/money/advice/the-prime-lending-rate->>]

Use the above information and graph to answer the questions that follow.

- 4.1.1 Define *inflation*.

(2)

- 4.1.2 (a) Calculate the mean prime interest rate over the period shown.

(3)

- (b) Describe the impact on an individual who took a loan of R100 000 from a bank linked to the prime interest rate in 2019. Support your answer with calculations using the interest rates provided on the graph.

(4)

- 4.1.3 Does increasing the prime interest rate have the desired effect of decreasing the inflation rate? Use values and dates from the graph to support your answer.

(3)

- 4.1.4 Determine the probability of randomly choosing a prime interest rate of 9% from the prime interest rates given. Give your answer as a percentage rounded off to two decimal places.

(4)

- 4.2 Bheki Zulu purchased his first house. He will need to pay a 15% deposit and then take out a home loan of R1 000 000 to cover the balance of the cost of the house. He looks at the following table, with some values omitted, to help him choose his monthly payments and period of the loan.

<div> <div>news 24</div> <div>Home loan repayment</div> </div>		
	R1 Million over 30 years	R1 Million over 20 years
Loan	R1 000 000	R1 000 000
Term (years)	30	20
Required monthly instalment	R7 337,65	R8 364,40
Total cost of credit	R2 641 554	
Months to repay	360	240
Total interest amount		

[Source: <<https://www.news24.com/citypress/personal-finance/how-extra-payments>>]

Use the above information to answer the questions that follow.

- 4.2.1 Calculate the total cash price of Bheki Zulu's house.

(3)

- 4.2.2 (a) Calculate the total cost of credit if he takes his home loan over 20 years.

(3)

- (b) Calculate the total interest he pays on his home loan over 20 years.

(2)

- (c) How much more would Bheki Zulu pay if he pays his home loan over 30 years?


(3)

- 4.2.3 Give another reason, besides the interest payable, that Bheki Zulu would need to consider when deciding to take his home loan over 20 or 30 years.

(2)
[29]

QUESTION 5

Billy Joel is 24 years old and works as a mechanic at a workshop called The Car Doctor. He earns a gross salary of R21 500 and pays R2 573,08 income tax per month. He has no other deductions. His March 2023 salary slip is shown below:

	The Car Doctor (Pty)Ltd	
	Phone:	021 981 3525
	Email:	cardoctorbrackenfell@gmail.com
Employee Name	Billy Joel	
Period	2023-03-01 to 2023-03-31	
ID Number	9910062487088	
Employee Number	EN035	
Income Tax Number	1036788754	
Income		
Basic salary	R21 500	
Deductions		
Tax (PAYE)	R2 573,08	
	Nett Pay	R18 926,92

- 5.1 He gets one of his friends, Tom Jones, to calculate his annual tax for the year 2023/2024. Tom Jones used the latest SARS tax table below to calculate Billy Joel's tax. Tom's calculation is shown below the tax table.

Annual Taxable income (R)	Rates of tax (R)				
1 – 237 100	18% of taxable income				
237 101 – 370 500	42 678 + 26% of taxable income above 237 100				
370 501 – 512 800	77 362 + 31% of taxable income above 370 500				
512 801 – 673 000	121 475 + 36% of taxable income above 512 800				
673 001 – 857 900	179 147 + 39% of taxable income above 673 000				
857 901 – 1 817 000	251 258 + 41% of taxable income above 857 900				
1 817 001 and above	644 489 + 45% of taxable income above 1 817 000				
Tax Rebates	Tax Year				
	2024/2023	2023/2022	2022/2021	2021/2020	2020/2019
Primary	R17 235	R16 425	R15 714	R14 958	R14 220
Secondary (65 and older)	R9 444	R9 000	R8 613	R8 199	R7 794

Tom's Tax Calculation

Tax = R42 678 + 26% (237 100)

Tax = R142 260 + R17 235

Tax = R159 495

- 5.1.1 Tom made two errors when calculating Billy's annual tax. Identify these two errors and then explain how these errors can be rectified.

(i) _____

(ii) _____

(4)

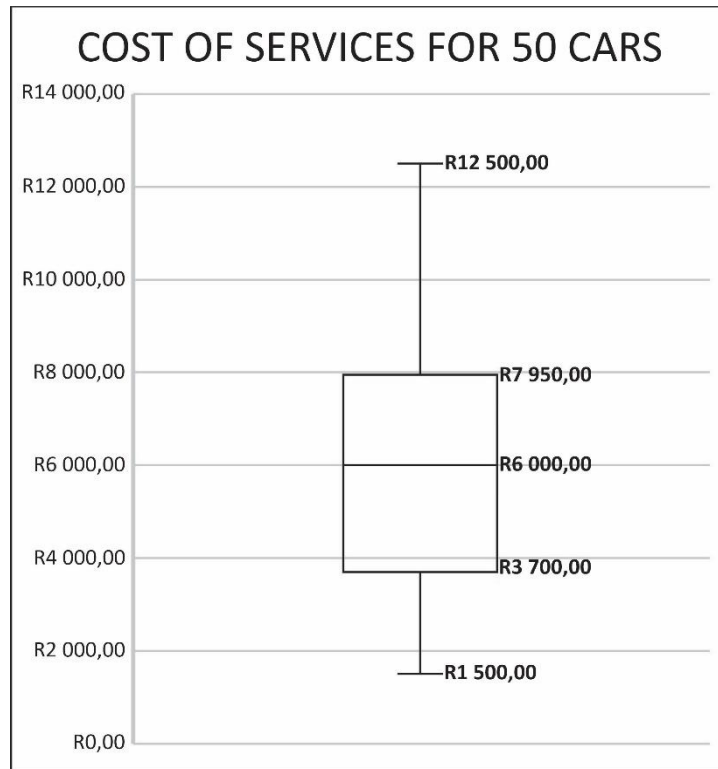
- 5.1.2 (a) Use the given tax table to calculate Billy Joel's annual tax for the year 2023/2024. Show all working details.

(6)

- (b) Has Billy Joel been paying the correct monthly tax? Use Billy's salary slip and calculations to support your answer.

(3)

- 5.2 The following box-and-whisker diagram shows the costs for servicing 50 different cars at the workshop where Billy Joel works.



Use the diagram above to answer the questions that follow.

- 5.2.1 Write down the median cost of servicing these cars.

(2)

- 5.2.2 (a) Determine the probability of randomly selecting a car costing more than R3 700 to service. Write your answer as a simplified fraction.

(3)

- (b) Calculate the number of cars that cost more than R3 700 to service.

(3)

5.2.3 Calculate the interquartile range.

(3)

5.2.4 Billy made the following statement:

"Less than 25% of cars cost more than R12 500 to service."

This statement is incorrect; use the data given to correct this statement.

"Less than 25% of cars cost more than _____ to service."

(2)

[26]

Total: 150 marks

CLEARLY INDICATE AT THE QUESTION THAT YOU USED THE ADDITIONAL SPACE TO ENSURE THAT ALL ANSWERS ARE MARKED.

[illegible]

[illegible]