MATHEMATICAL LITERACY: PAPER I

EXAMINATION NUMBER

Time: 3 hours   150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1.   This question paper consists of:
   - 24 pages that include 1 page at the back for extra calculations or rough work.
   - 5 questions.

2.   Please check that your question paper is complete.

3.   Answer ALL FIVE questions.

4.   Answer the questions in the space provided on this paper and hand it in at the end of the examination session.

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.   One blank page (page 24) is included at the end of the question paper. If you run out of space for a question, use this page. 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		35		37		31		15		150	

QUESTION 1

1.1 Ms R. Gumede took her car to Hi-Q (a tyre fitment centre) to do a 10-point safety check before driving to Durban. She was informed that she would need to replace two of her tyres. She received the financial document below, which she paid for using her credit card.

Hi-Q

Tyres, Batteries, Brakes & More

61 Victoria Road
Somerset West, 7130
Phone: 021 851 7004

INVOICE: 6359
DATE: 21/12/2021
DUE DATE: 31/12/2021

TO:

Ms R. Gumede
17 Mountain Road
Somerset West, 7130
Phone: 083 566 3434

COMMENTS OR SPECIAL INSTRUCTIONS:

Cash Customer
Honda Jazz
CAA 7821
125 430 km
Salesperson: Chris Warner

QUANTITY	DESCRIPTION	VAT %	UNIT PRICE	EXCL. VAT TOTAL	TOTAL
2	Falken Tyres 195/50R15	15%		R1 547,83	R1 780
1	Wheel Alignment	15%	R300	R260,87	R300

TOTAL EXCLUSIVE OF VAT	**R1 808,70**
TOTAL VAT	R271,30
SUB TOTAL	R2 080
TOTAL DUE	R2 080

Banking Details
Nedbank
Account number: 105 325 2078
Branch Code: 198765
Branch: Somerset
hiqswest@gmail.com
If you have any questions concerning this invoice, Chris Warner, 021 851 7124, hiqswest@gmail.com

Thank you for your business!

Use the information in the financial document to answer the questions that follow.

1.1.1   Write down the due date of this financial document.

_____

(2)

1.1.2   Name the type of financial document shown.

_____

(2)

1.1.3   State two ways of contacting Hi-Q.

_____

_____

_____

(2)

1.1.4   Give the name and address of the customer.

_____

_____

_____

(2)

1.1.5   (a)   State the total VAT amount payable for this transaction.

_____

(2)

(b)   Give the name of the bank that Hi-Q banks with.

_____

(2)

(c)   What does the acronym VAT stand for?

_____

(2)

1.1.6   State the unit price, including VAT, of the Falken tyres.

_____

(2)

1.1.7 Write as a unit ratio (to two decimal places), the total price of the tyres to the price of the wheel alignment in the form

1 : _____

_____

_____

_____

(2)

1.2 When purchasing tyres from Hi-Q, customers receive some free tyre insurance. If a customer's tyres get irreparably damaged, they receive credit towards replacing them. The amount of credit they receive is shown in the following graph.

TIME-BASED CREDIT MATRIX
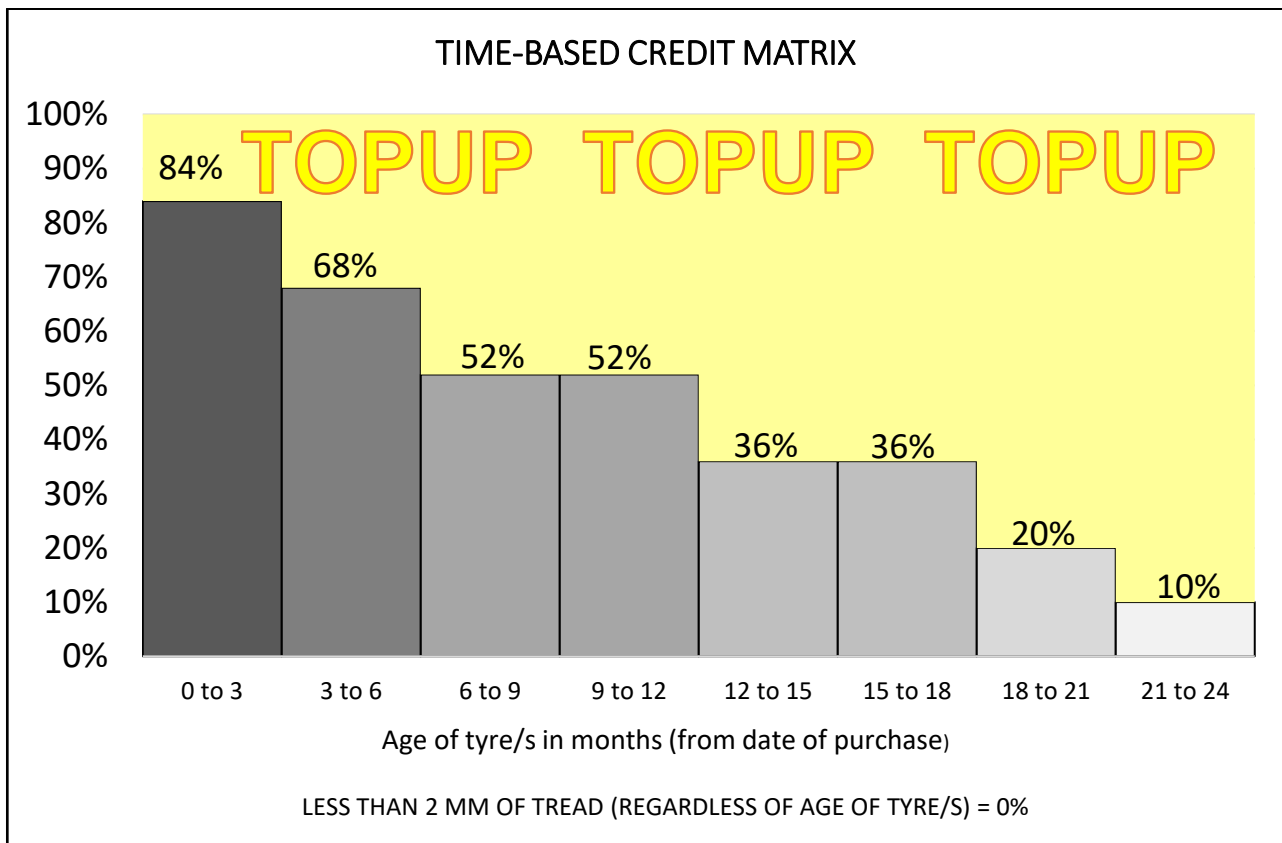
[Source: Hi-Q South Africa]

Maximum Benefit Value: R6 000 per tyre including VAT
Valid for two years.

TopUp TyreSurance: Pay a once off cost of 20% of tyre value to get 100% cover (valid for two years).

Use the above information to answer the questions that follow.

1.2.1 Name the type of graph illustrated.

_____

(2)

1.2.2 Write down the maximum benefit amount per tyre.

(2)

1.2.3 State the maximum number of months for this insurance cover.

(2)

1.2.4 When will a customer not enjoy any insurance benefit within the insurance period?

(2)

1.2.5 If the tyres were 14 months old, what percentage credit would R. Gumede receive? (Assume she has not paid the top-up amount.)

(2)

1.2.6 R. Gumede has the opportunity to TopUp her free TyreSurance for extra benefits.

(a)   Determine the cost to TopUp her TyreSurance for all the tyres she bought.

(2)

(b)   Using the given information, state the benefit of paying for this TopUp TyreSurance.

(2)
[32]

QUESTION 2

2.1 Dewald Brevis had a very successful under 19 (u19) World Cup in the West Indies during January and February 2022. Due to this success at the u19 World Cup, he was awarded an Indian Premier League (IPL) contract. He scored the following runs during the world cup tournament:

65 runs vs India; 104 runs vs Uganda; 96 runs vs Ireland; 97 runs vs England; 6 runs vs Sri Lanka; 138 runs vs Bangladesh.

[Source: <https://www.icc-cricket.com/news/2471465>]

Use the above information to answer the questions that follow.

2.1.1 (a) Calculate Brevis's mean number of runs scored.

(2)

(b) Determine his median number of runs scored.

(2)

(c) Calculate his range of runs scored.

(2)

2.1.2 Brevis's contract was valued at 3 Indian crore. Calculate the value of his contract in South African rand.

Write your final answer in words, without using any number values.

You may use the following exchange rates:

1 Indian crore = 10 million Indian rupees
1 rupee = R0,20

_____

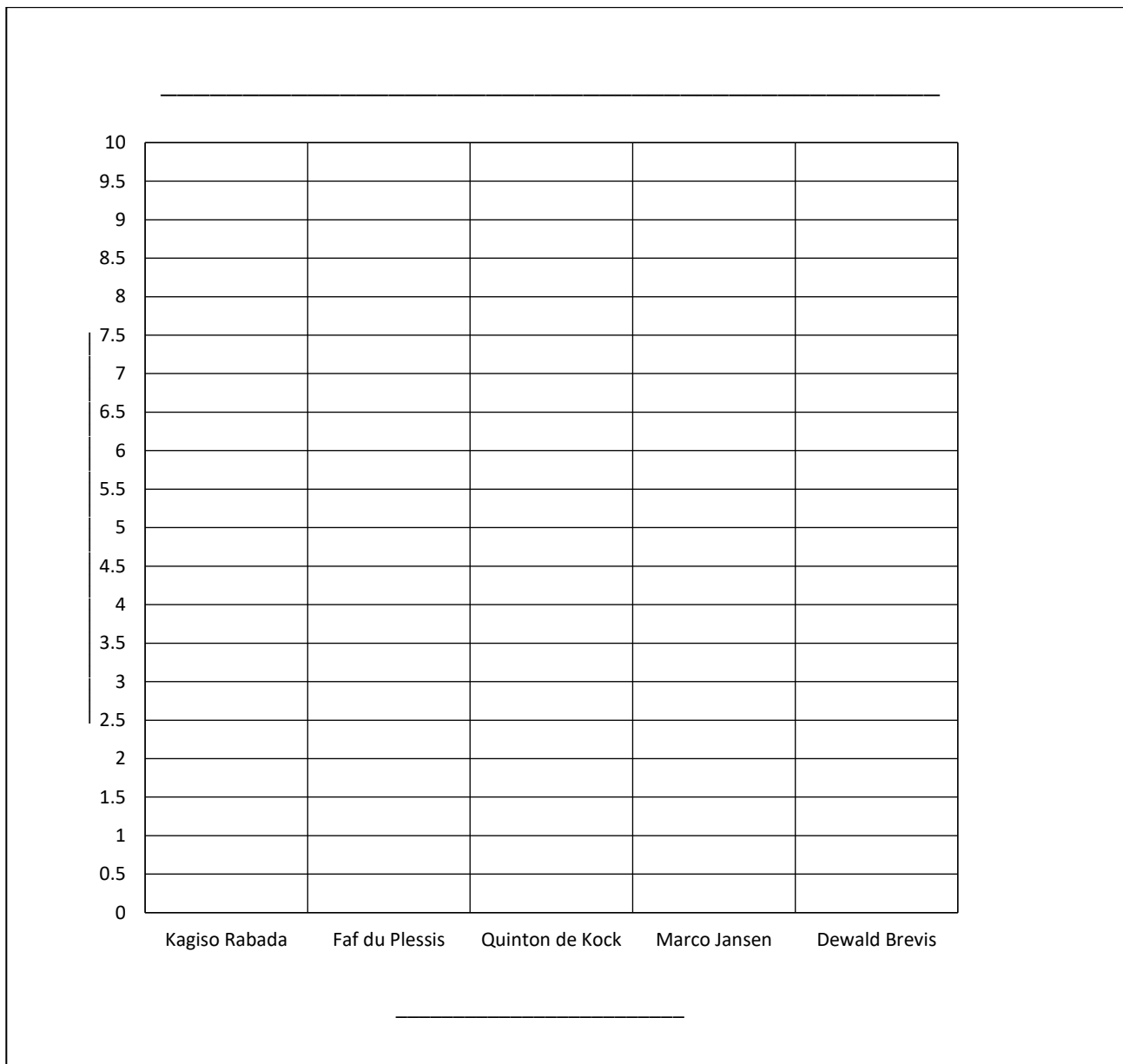_____

_____

_____

_____

_____

(5)

2.1.3 The following South African cricketers were awarded IPL contracts in 2022. The table below shows the names of the players together with their contract details.

Players	IPL Team	Base Price (Minimum asking price)	Contract Price (Sold for price)
Kagiso Rabada	PBKS	2 crore	9,25 crore
Faf du Plessis	RCB	2 crore	7 crore
Quinton de Kock	LSG	2 crore	6,75 crore
Marco Jansen	SRH	0,5 crore	4,2 crore
Dewald Brevis	MI	0,2 crore	3 crore

[Source: <https://timesofindia.indiatimes.com/sports/cricket/ipl/top-stories/ipl-2022-mega-auction-players-list-who-got-whom>]

(a) Use the table above to draw an appropriate graph on the grid below. Your graph must show the base price and contract price for each player. Provide suitable labels for each axis, an appropriate heading for your graph, and a key if necessary.

_____

	Kagiso Rabada	Faf du Plessis	Quinton de Kock	Marco Jansen	Dewald Brevis
10					
9.5					
9					
8.5					
8					
7.5					
7					
6.5					
6					
5.5					
5					
4.5					
4					
3.5					
3					
2.5					
2					
1.5					
1					
0.5					
0					

_____

(7)

(b)   Calculate the percentage increase in Kagiso Rabada's contract price from his base price. You may use the following formula:

$$\text{Percentage increase} = \frac{\text{new price} - \text{old price}}{\text{old price}} \times 100\%$$

_____

_____

_____

_____

_____

(4)

2.2   Dewald Brevis invests some of his earnings in shares*. He bought these shares using US Dollars.

*A share is proof of ownership of part of a company. The more shares you have, the more of the company you own, and you become known as a shareholder. This proof of ownership is represented by a share certificate, which today, is recorded electronically.

The graph below illustrates the value of $1 dollar in rand for a period of time over two days.

US Dollars vs Rand exchange rate:

1 USD = R14,4701 March 30, 2022
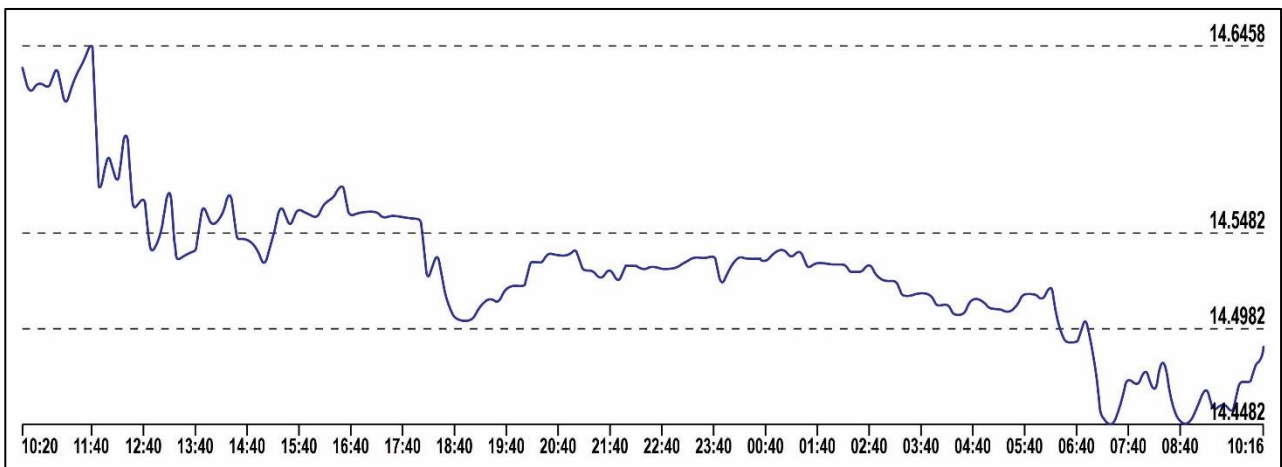
Brevis bought the following shares as illustrated in the table below.

Company	Number of shares purchased	Price per share in US Dollars
McDonald's	20	$248,17
Nike	50	$139,14
Netflix	30	$391,82

Use the above information to answer the questions that follow.

2.2.1   (a)   Name the type of graph used to show the currency exchange rate.

_____

_____

(2)

(b)   How would you describe the strength of the rand against the dollar over the time period shown? Use values and dates from the graph to help explain your answer.

_____

_____

_____

_____

_____

(4)

(c)   Explain how this graph is misleading. Use values from the graph to support your answer.

_____

_____

_____

_____

_____

(2)

2.2.2   Calculate, in rand, the total amount Brevis needs to purchase all these shares.

_____

_____

_____

_____

_____

_____

(5)
[35]

QUESTION 3

3.1 Dewald Brevis wants to upgrade his cell phone. He would like to get the iPhone 13 Mini. He looks at the following three options:

Option 1: Telkom
R700 per month × 24
25 free minutes per month and a mobile call rate of R1,60 per minute.

Option 2: Vodacom
R900 per month × 36
100 free minutes per month and a mobile call rate of R0,80 per minute.

Option 3: MTN
R950 per month × 3 years
200 free minutes per month and a mobile call rate of R0,80 per minute.

[Adapted from source: <https://www.istore.co.za/iphone-13-or-13-mini>]

Use the above information to answer the questions that follow.

3.1.1 Use the fixed monthly costs and calculations to determine the total fixed cost that will be paid for each of the three contracts.

(4)

3.1.2 Explain, <u>without using the fixed monthly costs</u>, which two factors will influence Brevis to choose one of the cell phone contracts.

(4)

3.1.3 If Brevis randomly chooses one of these contracts, determine the probability that he would choose: (Give your answer to two decimal places.)

(a) MTN

_____

_____

_____

(2)

(b) Vodacom or Telkom

_____

_____

_____

(2)

3.1.4 The cash price of an iPhone 13 Mini is R15 500 inclusive of VAT.

(a) Calculate the amount of VAT paid on the cash price of R15 500.

_____

_____

_____

_____

(3)

(b) What advice will you give Brevis to help him choose between paying cash or taking the Telkom monthly contract? Show all your calculations to motivate your answer.

_____

_____

_____

_____

_____

_____

_____

(4)

3.1.5 Use the given data to calculate the missing values (a), (b) and (c) in the table below.

Minutes	0	10	25	50	100	(c)
Total cost per month for Option 1: Telkom	(a)	R700	R700	(b)	R820	R980
Total cost per month for Option 2: Vodacom	R900	R900	R900	R900	R900	R980

(a) _____

_____

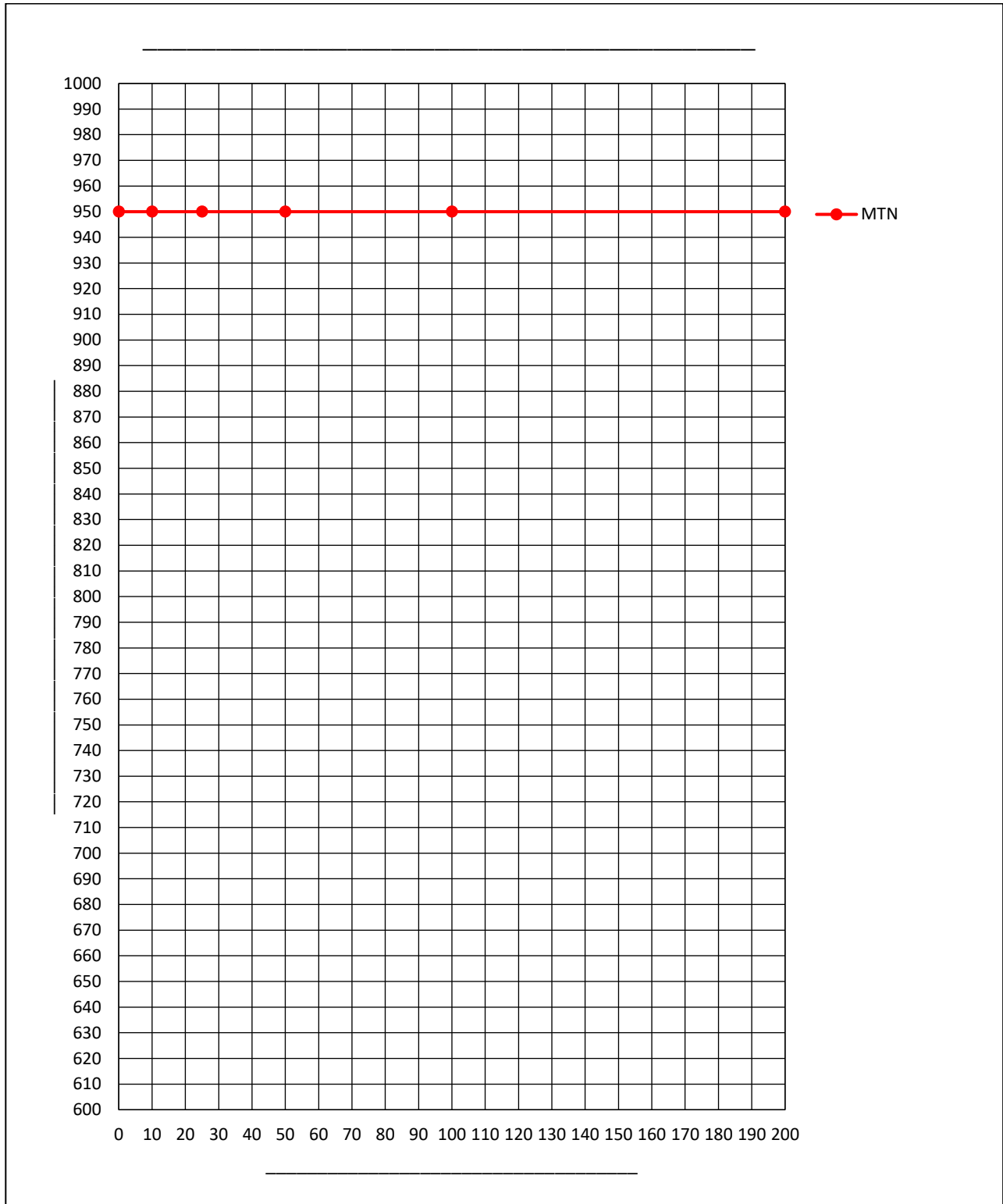(b) _____

_____

_____

(c) _____

_____

_____

(6)

3.1.6   The grid below shows the graph for Option 3: MTN.

Use your completed table for **Question 3.1.5** to draw two more linear graphs on the same grid below, showing the relationship between the number of minutes used and the cost per month for Option 1 and Option 2.
Note: Option 3 has already been drawn for you.

_____

_____

(6)

3.1.7   (a)   Write down the number of minutes and cost, at which the cost for Option 1 and Option 3 are the same.

(2)

(b)   Determine after how many call units, the MTN contract becomes more economical when compared to the other two service providers.

(2)

3.1.8   If Brevis uses more than 25 call minutes, but less than 180 call minutes per month, which contract would be the most cost-effective? Give a reason for your choice.

(2)
[37]

QUESTION 4

4.1   The following stepped tariff table is used by the City of Johannesburg for electricity charges. The tariff table includes the 2021/2022 increase in electricity costs of 14,59%.

Residential Single Phase 60A 2021/2022

Block name	kwh used	Tariff (cents/kwh) including VAT
Block one	0–500 kwh	146,48
Block two	501–1 000 kwh	169,11
Block three	1 001–2 000 kwh	182,07
Block four	2 001–3 000 kwh	192,47
Block five	More than 3 000 kwh	202,25
*Service charge in cents per month (including VAT)		169,30
*Capacity charge in cents per month (including VAT)		498,74
*_These are two compulsory monthly charges_		

[Adapted from source: <https://www.citypower.co.za/customers/Documents>]

Use the information provided to answer the questions that follow.

4.1.1   Sashin uses 1 100 units of electricity during January 2022. He calculates this to be R1 766,70 (including VAT) for the month. Using calculations, show he is correct.

(6)

4.1.2   Calculate, in rand rounded to <u>two decimal places</u>, the average cost per unit for the 1 100 units of electricity consumed by Sashin for January 2022.

(3)

4.1.3 Calculate how much Sashin would have paid for the same 1 100 units of electricity in the previous financial year.

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_____

_____

_____

(3)

4.1.4 Use the step graph to complete the following tariff table that shows the electricity tariffs for 2021/2022. Block one has already been completed for you in the table.
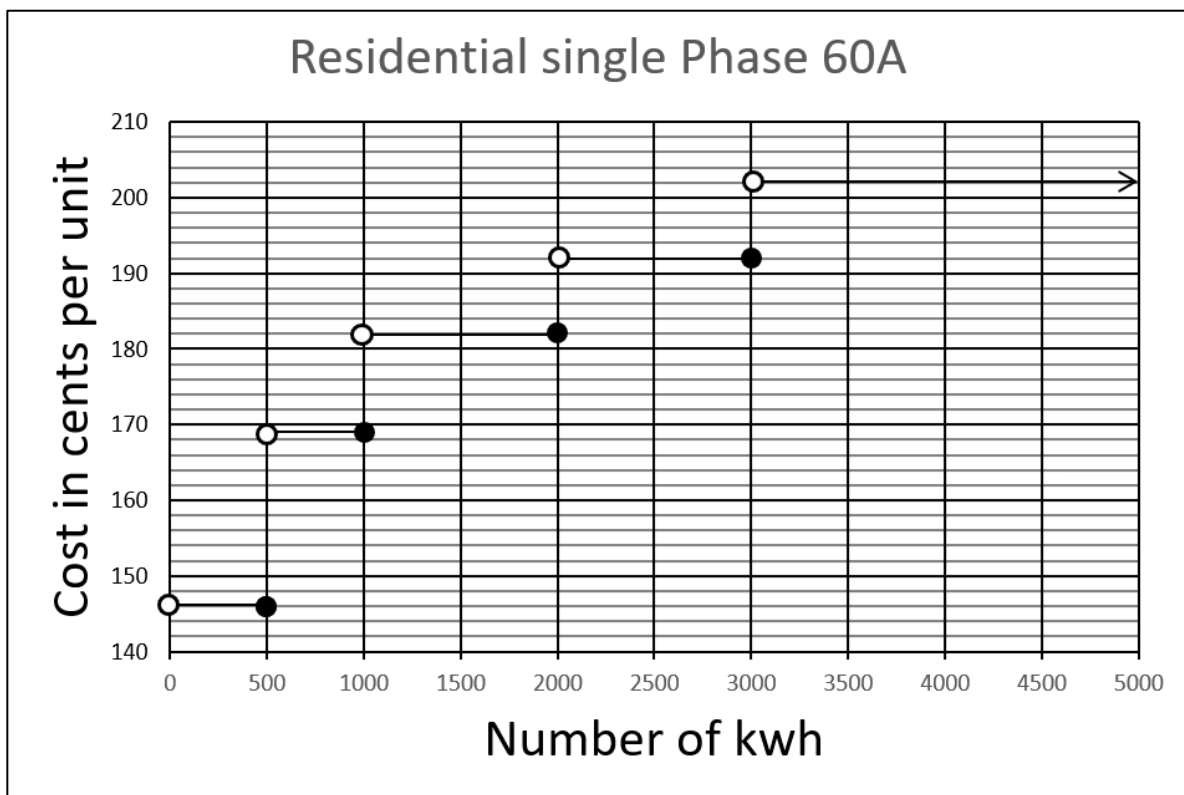
Residential Single Phase 60A 2021/2022

Block name	kwh used	Tariff (cents/kwh) Including VAT
Block one	0–500 kwh	146
Block two	501–1 000 kwh	(a)
Block three	(b)	182
Block four	2 001–3 000 kwh	192
Block five	(c)	(d)

[Adapted from source: <https://www.citypower.co.za/customers/Documents>]

(5)

4.2   The following stacked bar graph shows the average electricity price percentage increase versus the annual inflation rate of South Africa.

Eskom average price increase % versus inflation %
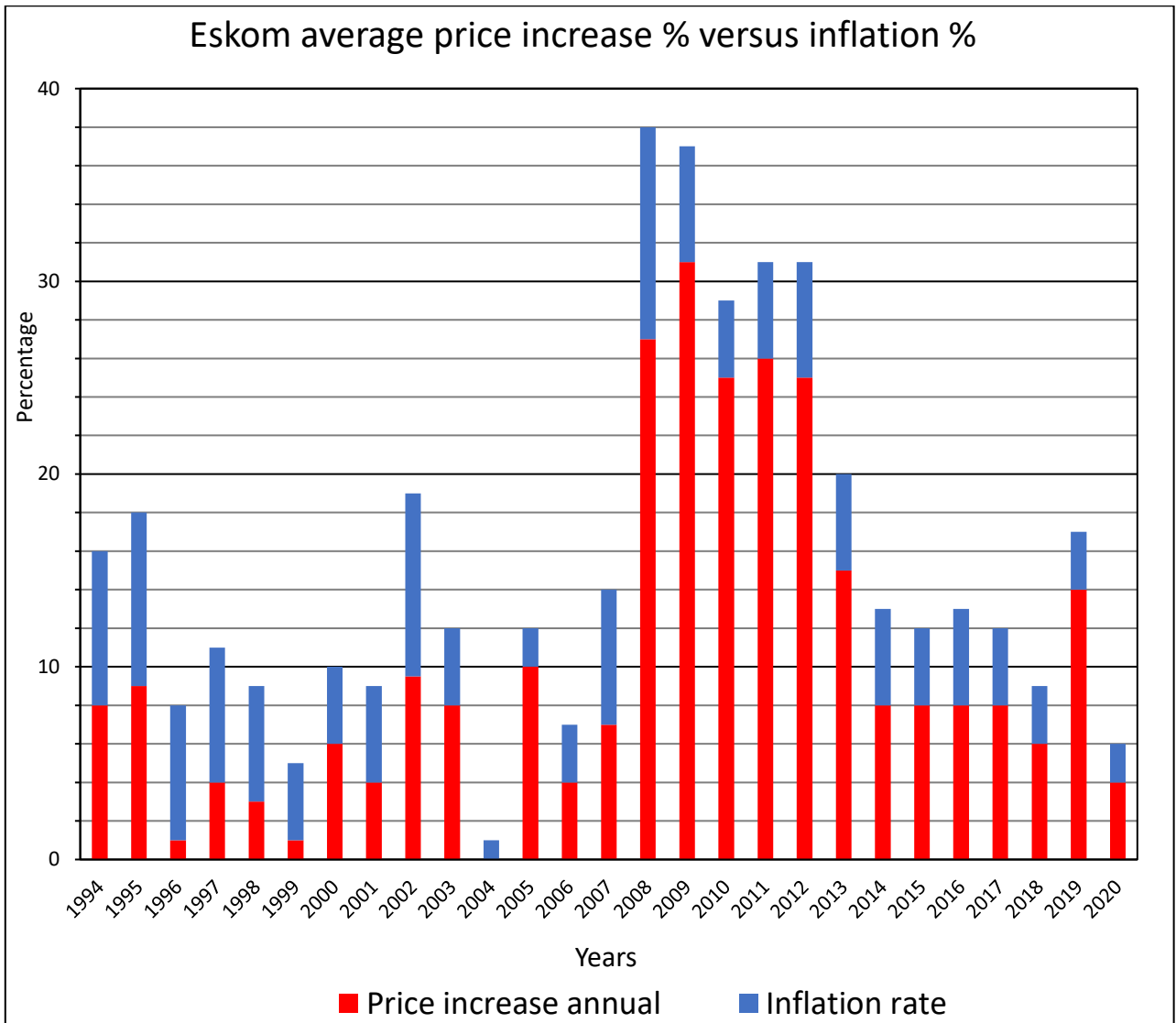
[Source: <https://mybroadband.co.za/news/energy>]

Use the graph provided to answer the questions that follow.

4.2.1   Determine the annual inflation rate during 2020.

(2)

4.2.2   Calculate, as a percentage, the probability of randomly selecting a year in which the annual price increase percent and the inflation rate percent were exactly the same.

(4)

4.2.3 Determine the year which had the largest increase in the price of electricity. Write down the value of this percentage increase.

_____

_____

_____

(2)

4.2.4 Load-shedding was implemented for the first time in 2007. What effect, if any, did this have on the annual electricity price increase? Use values from the graph to support your view.

_____

_____

_____

_____

(3)

4.2.5 Sashin says that the higher the inflation rate increase, the higher the increase in electricity. Use <u>dates and values</u> from the graph to show that Sashin is incorrect.

_____

_____

_____

_____

(3)
[31]

QUESTION 5

Wade Spears is a 28 year old teacher. He earns R45 000 a month and contributes 15% of his salary to his pension fund each month. Use the tax table below to answer the questions that follow.

2023 tax year (1 March 2022–28 February 2023)

Taxable income (R)	Rates of tax (R)
1–226 000	18% of taxable income
226 001–353 100	40 680 + 26% of taxable income above 226 000
353 101–488 700	73 726 + 31% of taxable income above 353 100
488 701–641 400	115 762 + 36% of taxable income above 488 700
641 401–817 600	170 734 + 39% of taxable income above 641 400
817 601–1 731 600	239 452 + 41% of taxable income above 817 600
1 731 601 and above	614 192 + 45% of taxable income above 1 731 600

Tax Rebate

Primary	R16 425
Secondary (65 and older)	R9 000
Tertiary (75 and older)	R2 997

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

5.1   Calculate Wade's **annual**:

      5.1.1 Gross salary.

                                                                       (2)

      5.1.2 Pension fund contribution.

                                                                       (2)

      5.1.3 Taxable salary.

             Annual taxable salary = annual gross salary – annual pension contribution

                                                                       (2)

      5.1.4 Tax for the year ending 28 February 2023.

                                                                         (6)

5.2   The tax threshold for tax payers under 65 years old is R91 250.

Use the tax table, with calculations, to show how this amount was calculated.

_____

_____

_____

(3)
[15]

Total: 150 marks

ADDITIONAL SPACE (ALL questions)

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