higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY

(First paper)

NQF LEVEL 2

(10401012)

14 February 2025 (Y-paper)
13:00–16:00

Drawing instruments and non-programmable calculators may be used.

This question paper consists of 11 pages and 2 answer sheets.

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MATHEMATICAL LITERACY
(First paper)
NQF LEVEL 2
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 used in this paper.
5. Round off the answers to TWO decimals places where necessary, unless stated differently.
6. Drawing instruments, including rulers, compasses and protractors may be used.
7. Diagrams are not necessarily drawn to scale.
8. Answer QUESTION 4.1.5 on ANSWER SHEET A and QUESTIONS 5.2.3 and 5.2.6 on ANSWER SHEET B (attached). Write your EXAMINATION NUMBER on each ANSWER SHEET, detach it from the question paper and hand it in with the ANSWER BOOK.
9. Use only a black or blue pen.
10. Write neatly and legibly.

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QUESTION 1

1.1 Calculate the following. Show all your calculations.

1.1.1 $40 + 30 \div \frac{1}{2}$

1.1.2 $(22 - 7) - (-5) + 7^2$

(2 × 2) (4)

1.2 School fees will increase by 9 % from 2024 to 2025. If the school fees were R22 900 in 2024, how much will it be in 2025? (3)

1.3 Calculate the value for A, B and C in the table below. Do not copy the table into the ANSWER BOOK. Show only your calculation next to the letter (A–C) in the ANSWER BOOK.

FRACTION	PERCENTAGE	DECIMAL
A	50 %	0,5
$\frac{3}{4}$	**B**	0,75
$\frac{4}{5}$	80 %	**C**

(3 × 2) (6)

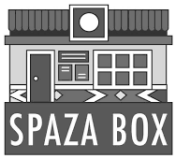
1.4 There are 400 tomatoes that needs to be packed in boxes. Each box will contain 14 tomatoes.
How many boxes can be filled? (3)

1.5 Pam is studying for the exams. On Saturday she studied from 8 am to 9.30 am, and then from 11.30 am to 12.30 pm and once again from 2.30 pm to 4.30 pm.

1.5.1 Convert 2.30 pm (analogue time/12 hour clock) to digital time (24 hour clock). (1)

1.5.2 How long did Pam study for on Saturday? (4)

1.6 Sandile and Jimbo own a small spaza shop. Each weekend they take turns to work in the shop. They divide their profit at the end of the weekend between themselves by looking at how many hours they worked in the spaza shop. Sandile worked for 12 hours and Jimbo for 18 hours.



1.6.1 Write down the ratio to determine how they will divide their profit for the weekend. Write your answer in the simplest form. (2)

1.6.2 The profit for the weekend was R888. Divide the profit for the weekend between Sandile and Jimbo according to the ratio in QUESTION 1.6.1. (4)

1.7 A car travels 350 km in 4 hours. Calculate the average speed at which the car travelled.

Use the formula: $\text{Speed} = \frac{\text{distance in km}}{\text{time in hours}}$ (3)

[30]

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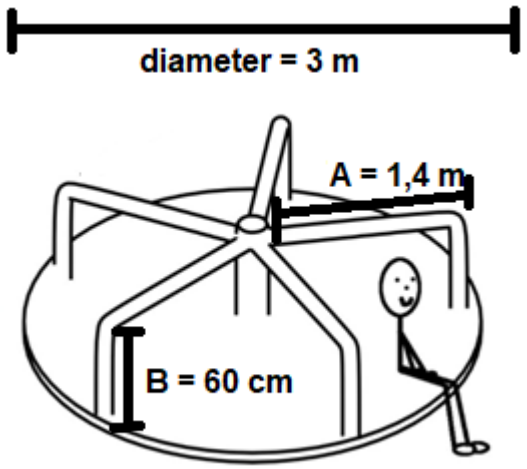
QUESTION 2

2.1 Study the sketch below and answer the questions that follow.

A carousel, as indicated in the adjacent sketch, is being installed on the playground. The carousel consists of a flat, round disc and handrails for people to hold on to. The handrails are made from round tubing.

The diameter of the carousel is 3 m.

The horizontal part of the handrail is 1,4 m (A on the sketch) and the vertical part is 60 cm (B on the sketch).



[Source: Adapted from *https://borsaliz.com/?m=6-classic-merry-go-round-nn-j9BN6wUv*]

2.1.1 Name the two-dimensional shape of the flat, round disc. (1)

2.1.2 Calculate the area of the flat, round disc of the carousel.

Use the formula: $A = \pi r^2$ where $\pi = 3{,}14$ (4)

2.1.3 How many handrails appear on the sketch of the carousel? (1)

2.1.4 Convert the measurement of B to metres (m). (2)

2.1.5 Round tubing can be bought for R135 per metre. The round tubing is only used for the handrails and not the central axis of the merry-go-round.

Calculate the cost to buy the round tubing for the carousel. (5)

2.2 The hostel at the college is planning to supply each room with a container in which to store water. The dimensions of the containers are as follows:

Length: 25 cm
Width: 18 cm
Height: 26 cm

Volume = length × width × height

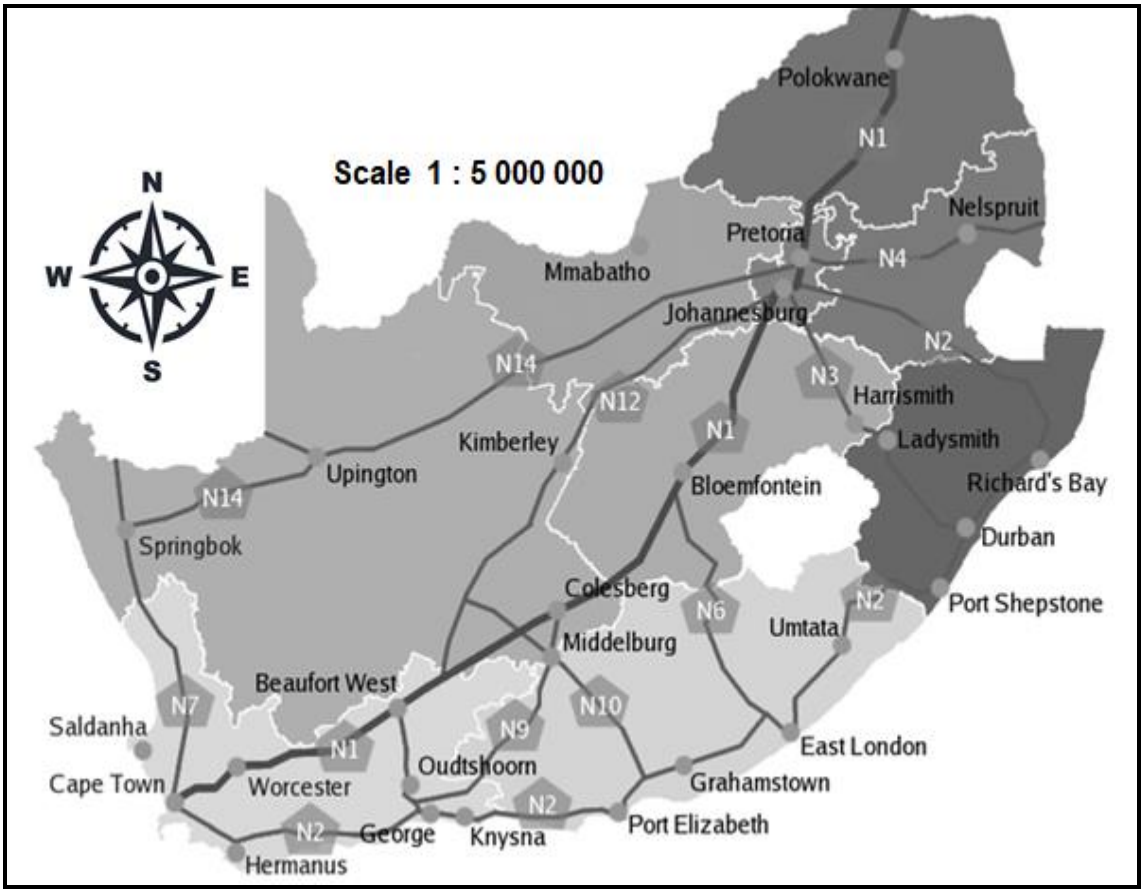


[Source: *https://www.amazon.in/*]

2.2.1 Name the three-dimensional shape of the water container. (1)

2.2.2 Calculate the total volume (in cm³) of three water containers. (4)

2.3 The map below shows some of the main routes in South Africa. Study the map and answer the questions that follow.



[Source: Adapted from *https://en.m.wikipedia.org/wiki/File:South_Africa_roads_N1.png*]

2.3.1 In which direction is Upington from Middelburg? (2)

2.3.2 Which town is North of Saldanha? (1)

2.3.3 On which route would you travel to drive from Pretoria to Nelspruit? (1)

2.3.4 Through which TWO towns will one travel if driving on the N2 from Hermanus to Port Elizabeth? (2)

2.3.5 What is the scale of the map? (2)

2.3.6 The distance between East London and Bloemfontein is 119 mm on the map.

Calculate the real distance between the two points. Give your answer in km.

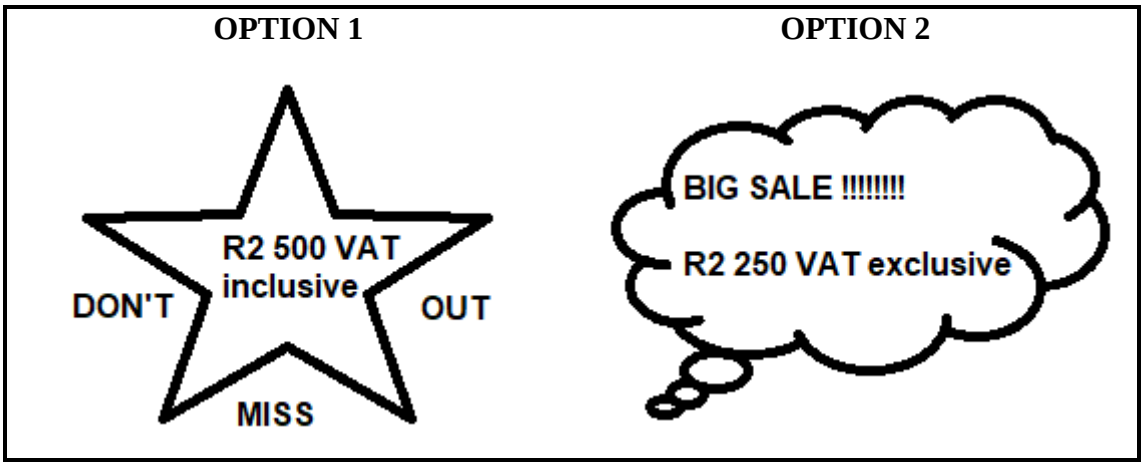
HINT: 1 m = 1 000 mm ; 1 km = 1 000 m (4)

[30]

QUESTION 3

3.1 Sandy is saving money to buy a bicycle. She did some research on prices. The options available to her are given below.

Study the information and answer the following questions that follow.



3.1.1 Give TWO reasons why it is important to save money every month. (2)

3.1.2 Would buying a bicycle be an income or expense on Sandy's budget? Give a reason for your answer. (2)

3.1.3 What does the acronym VAT stand for and what does it mean if a price is VAT exclusive? (2)

3.1.4 Advise Sandy on the option to choose when she buys the bicycle.

Give a reason for your answer. Show all your calculations. (4)

3.1.5 Sandy decides to choose Option 1. She has linked her phone to her bank account and is able to use PayShap to make the payment. PayShap allows one to tap one's phone to make a payment.

Alternatively, Sandy can draw money at the ATM to pay for the bicycle in cash. The following transaction fees apply:

PayShap: R45 for transactions over R1 000
Draw money at ATM: R2,40 per R100

Which method of payment would be cheaper? Show all your calculations. (4)

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3.2 The table below shows a comparison of call tariffs on pre-paid phones for the different service providers. Study the table and answer the questions that follow.

Service provider	Vodacom	MTN	Cell C	Telkom
Tariff plan	**Anytime per second**	**Pay per second**	**66c on prepaid**	**Sim Sonke**
Per minute fee	**R1,20**	**R0,79**	**R0,66**	**R0,75**

[Source: *https://www.icasa.org.za/uploads/files/Q2-2016-17-Retail-Tariffs-Report-24Mar-2017.pdf*]

3.2.1 Which service provider is the least expensive per minute? (1)

3.2.2 How much does Vodacom charge per second for a call? (3)

3.2.3 If one uses an average of 150 minutes for calls per month, how much would you save per month if you used Cell C instead of Vodacom?

Show all your calculations. (5)

3.3 An extract from a bank statement is show below. Study the bank statement and answer the questions that follow.

DATE	DESCRIPTION	REFERENCE	AMOUNT	BALANCE
10 March	Opening balance			941,32
14 March	Medilife	6879	86,80-	854,52
14 March	Medilife	6879	340,46-	514,06
22 March	Osprey	OS843	8 567,00	9 081,06
25 March	Nedbank account	NA5699924	6 600,00-	**A**
26 March	Chattermouth	45GHT99	196,00-	2 285,06
28 March	Charity	44RQW112	57,00-	2 228,06
31 March	Monthly service fee		80,50-	2 147,56
5 April	Sanctum	S87987	1176,71-	970,85
9 April	Monthly account fee		24,50-	946,35

3.3.1 What was the opening balance on the bank statement? (1)

3.3.2 What was the reference of the Chattermouth payment on 26 March? (1)

3.3.3 Calculate the total bank costs (fees) on the bank statement. (2)

3.3.4 Calculate the value of A on the bank statement. (3)

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QUESTION 4

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

A car rental company charges R300 per day to rent out a car. The price includes 100 kilometres free travelling.

The company charges a further R1,50 per kilometre for any additional kilometres travelled (more than 100 kilometres).



Distance in kilometres	100	120	140	160	**B**	200
Cost in rand	300	330	360	**A**	420	450

4.1.1 Calculate the values for A and B in Table 4.1 above. Do not copy the table into the ANSWER BOOK but simply write the calculation next to the letter (A–B) in the ANSWER BOOK. Use the following formula:

Cost in rand = R300 + R1,50 (kilometres more than 100) (5)

4.1.2 Calculate the cost if a person travels 400 kilometres per day. (3)

4.1.3 Name the dependent variable. (1)

4.1.4 Are the values in Table 4.1 representative of a direct or an indirect/inverse proportion? Substantiate your answer. (3)

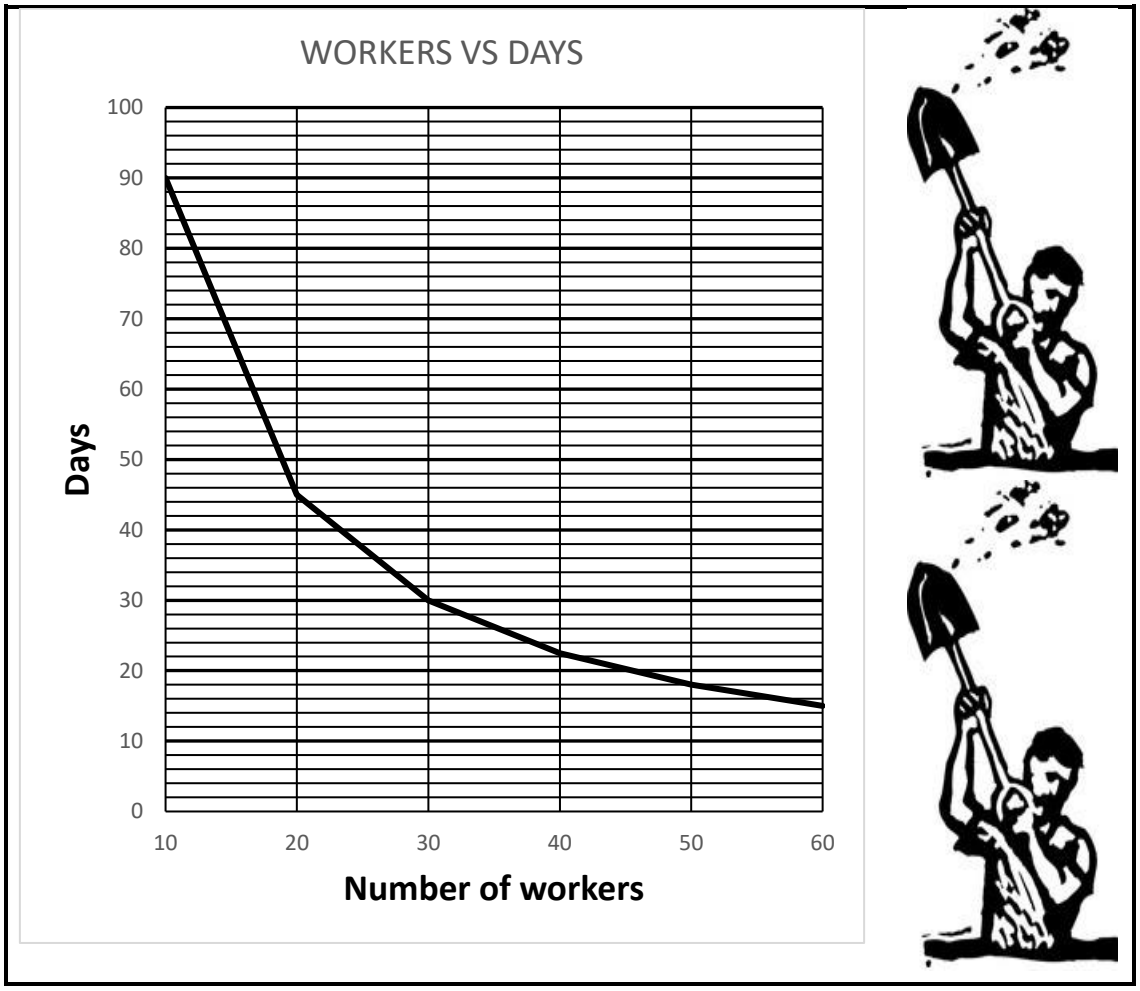
4.1.5 Use the values in Table 4.1 to draw a straight-line graph that represents the distance in kilometres to the cost in Rand on ANSWER SHEET A (attached).

Supply a suitable heading and labels for the graph. (6)

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4.2 A team of 10 workers dug a trench. It took the workers 90 days to complete the task. Below is a graph to show how long it would have taken to dig the trench if more workers were used.

Study the graph below and answer the questions that follow.



4.2.1 How many days would it take 30 workers to complete the trench? (1)

4.2.2 How many workers would it take to dig the trench in 18 days (1)

4.2.3 How many days would it take 90 workers to dig the trench?

Use the formula: Days = $\frac{900}{\text{Number of workers}}$ (2)

4.2.4 Is the graph an example of a direct or indirect/inverse proportion?

Give a reason for your answer. (3)

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4.3 Study the set of numbers below and answer the questions that follow.

800; 400; 200; …; …; … .

4.3.1 Complete the missing numbers for the above pattern. (3)

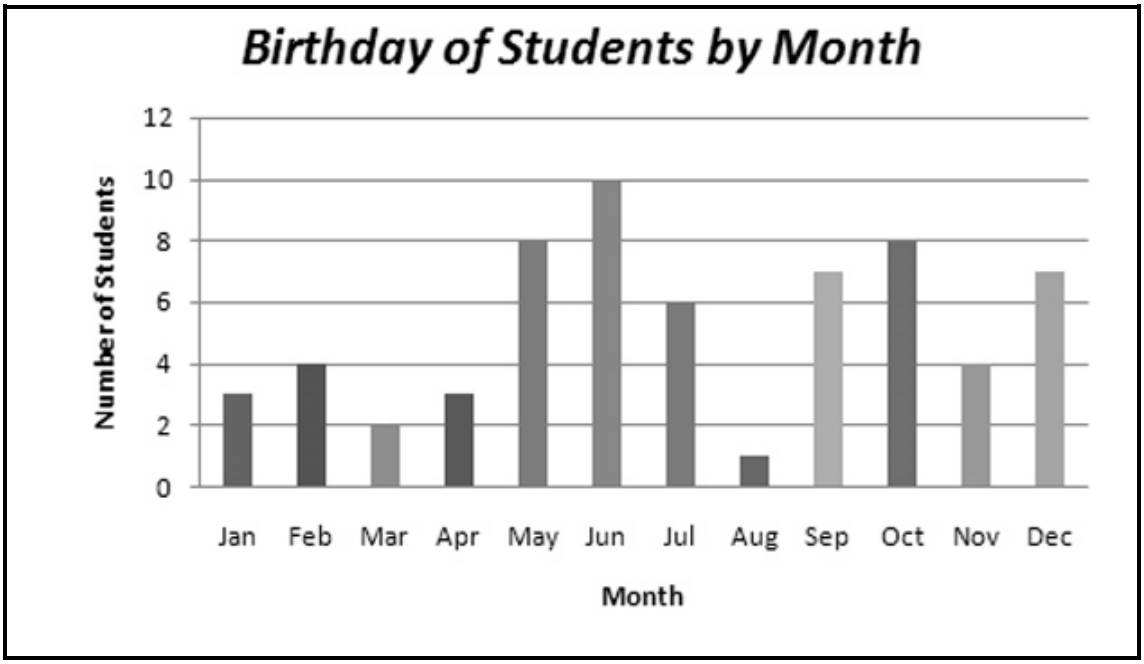
4.3.2 Is the set of numbers an example of an arithmetic (constant difference) or a geometric (constant ratio) pattern? Give a reason for your answer. (2)

[30]

QUESTION 5

5.1 The mechatronics program at a college did a study to see in which month their students have their birthdays. The graph displays the information that was gathered.

Study the graph and answer the questions that follow.



[Source: *https://wikieducator.org/MathGloss/B/Bar_Graph*]

5.1.1 Name the type of graph shown above. (1)

5.1.2 Would the data be gathered by means of an observation or an interview? (1)

5.1.3 What is the sample size used during this data collection? (2)

5.1.4 Which TWO months had the least number of birthdays? (2)

5.1.5 Calculate the difference in the number of birthdays in June and August. (2)

5.1.6 Calculate the average/mean number of birthdays per month. (3)

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5.2 A lecturer wanted to check his class absenteeism during the term and recorded each students' attendance. The information in the table below show the number of days that each student was absent during the term.

Study the table below and answer the questions that follow.

0	1	0	1	1	2
2	4	3	3	1	3
2	4	1	2	0	4
1	0	2	0	5	8

5.2.1 Would the data that the lecturer gathered during the term be based on fact or opinion? (1)

5.2.2 What was the sample size of the study? (1)

5.2.3 Use the data in the table to complete the frequency table in ANSWER SHEET B (attached). (6)

5.2.4 What was the modal number of days for students to be absent during the term? (1)

5.2.5 What was the average/mean number of days that students were absent during the term?

Round the answer to the nearest day. (4)

5.2.6 Use the information in the frequency table in QUESTION 5.2.3 to draw a histogram on ANSWER SHEET B (attached).. (6)

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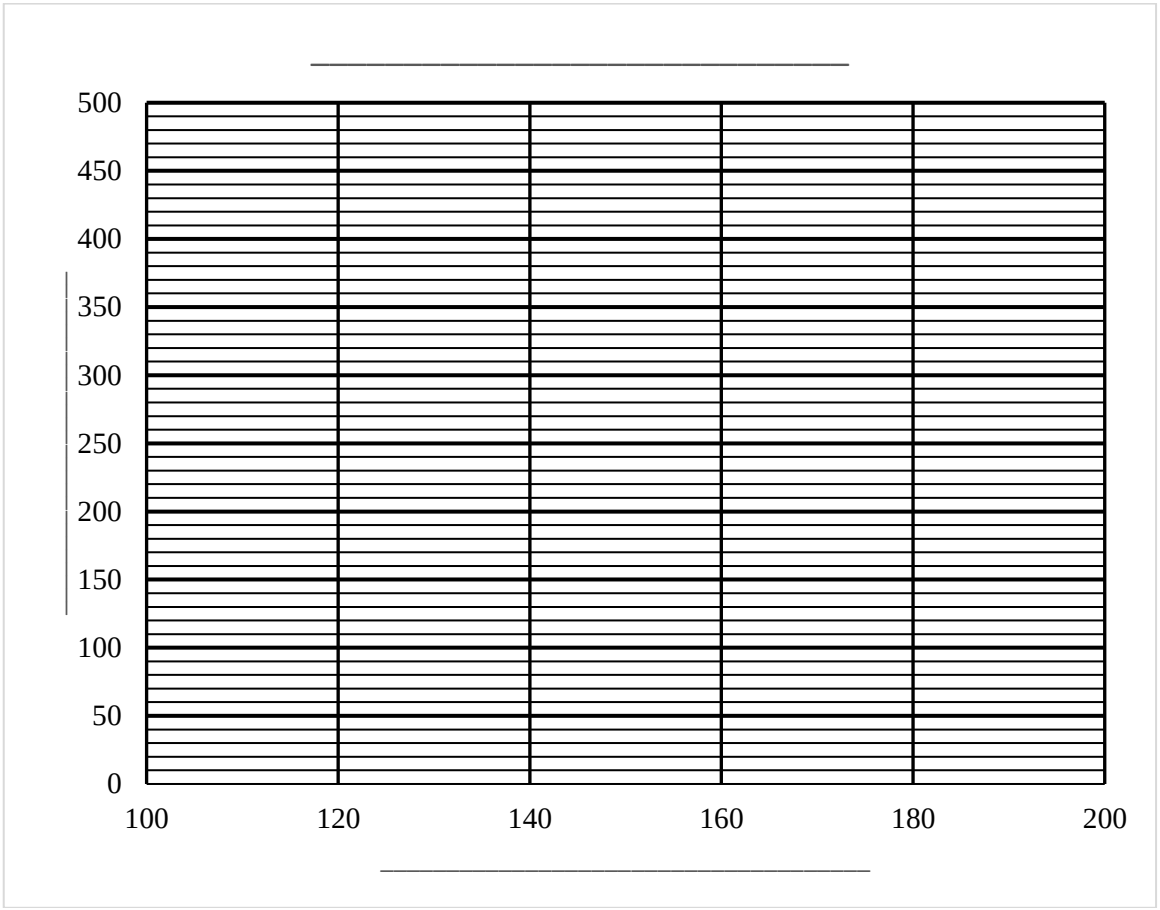
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EXAMINATION NUMBER:

ANSWER SHEET A

QUESTION 4.1.5



6

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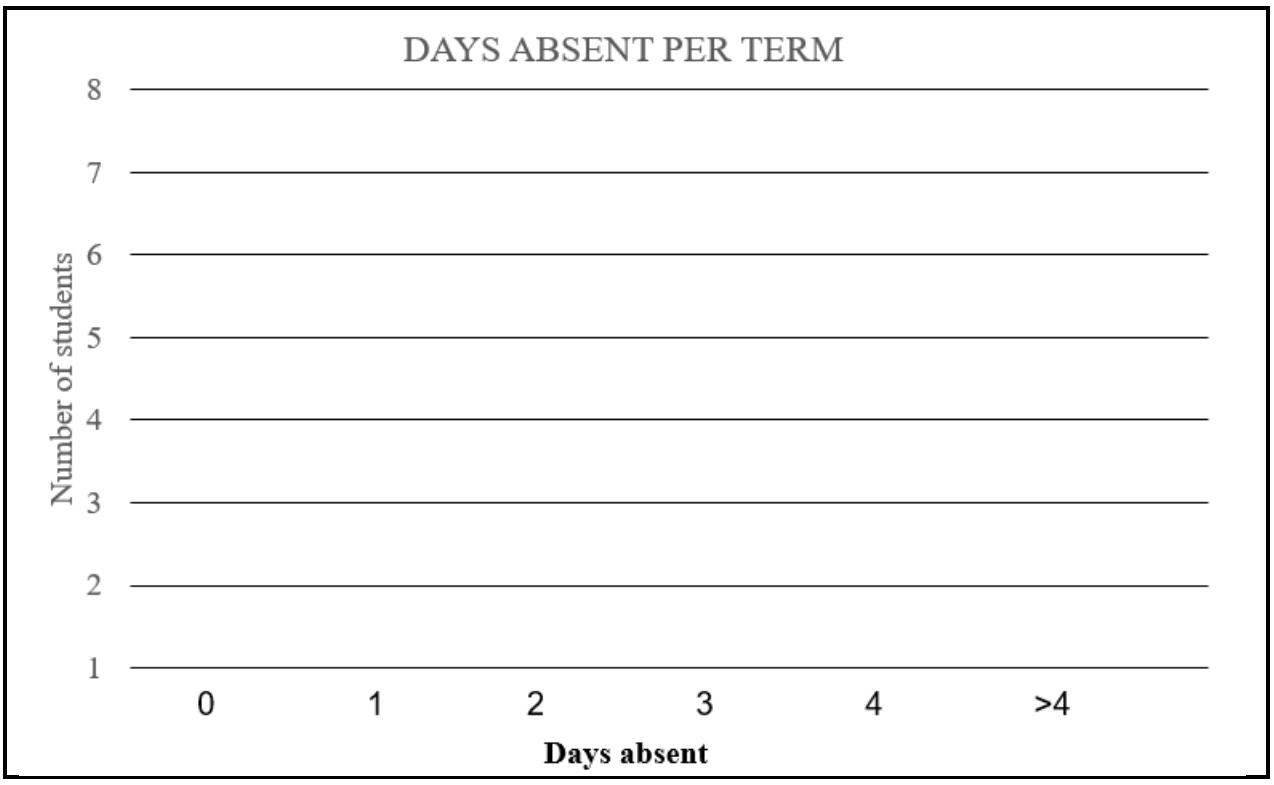
ANSWER SHEET B

QUESTION 5.2.3

Days absent	Tally	Frequency
0		
1		
2		
3		
4		
>4		

6

QUESTION 5.2.6



6

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