higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY

NQF LEVEL 3

(Second paper)

(10401023)

15 November 2023 (X-paper)
09:00–12:00

Nonprogrammable calculators and drawing instruments may be used.

This question paper consists of 9 pages and 2 answer sheets.

045Q2N2315

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
MATHEMATICAL LITERACY (SECOND PAPER)
NQF LEVEL 3
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. Answer QUESTION 2.1.8 and QUESTION 3.2.3 on the attached ANSWER SHEET 1 and answer QUESTION 4.1.1 and QUESTION 4.1.2 on the attached ANSWER SHEET 2. Write your EXAMINATION NUMBER on the ANSWER SHEET, detach it from the question paper and hand it in with the ANSWER BOOK
5. Write your EXAMINATION NUMBER and CENTRE NUMBER on each ANSWER SHEET, detach them from the question paper and submit it with the ANSWER BOOK.
6. Start each question on a new page.
7. Clearly show all calculations.
8. Round off answers according to the given context. In all cases where the context is not specific, round off the answers to TWO decimal places.
9. Indicate units of measurement where applicable.
10. Diagrams are not necessarily drawn to scale.
11. Write neatly and legibly.

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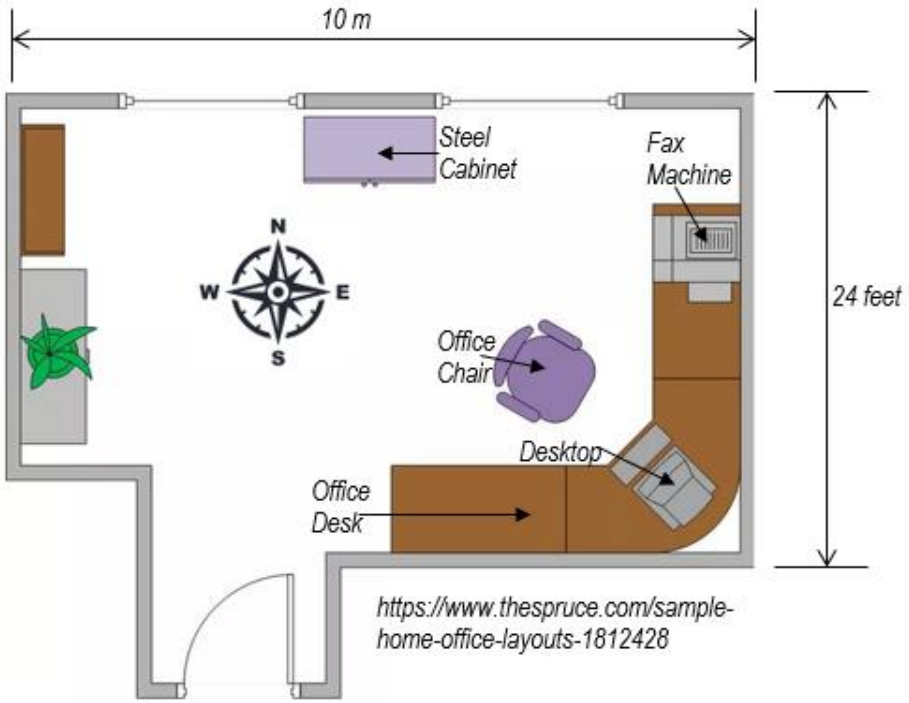
QUESTION 1

1.1 Given below is a floor plan of the office. Use the information found on the floor plan and answer the questions that follow:



1.1.1 What is direction of the fax machine as seen from the door? (1)

1.1.2 How many windows are there on the floor plan? (1)

1.1.3 How many doors are there on the floor plan? (1)

1.1.4 Covert length given in feet on the floor plan to metres if 1 foot is equal to 0,3048 metres. (3)

1.1.5 Determine the scale in centimetres (cm) that may be used to draw the floor plan. (3)

1.1.6 If 35 mm was measured on the floor plan, use the scale in QUESTION 1.1.5 to determine the actual length. (3)

[40]

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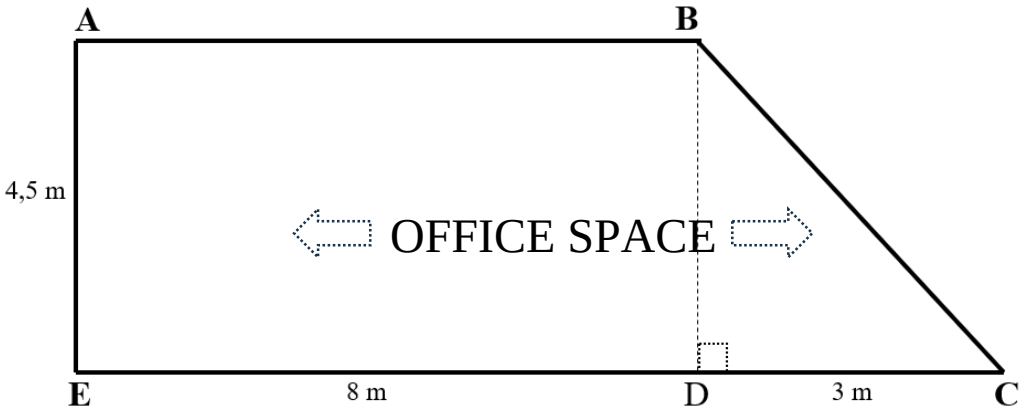
1.2 A diagram given below represents a plan an office. The plan is in a shape of a rectangle ABDE combined with a right angled triangle BCD. Use the information found on the diagram and answer the questions that follow:



1.2.1 Calculate the perimeter of the entire office.

Formula: $BC^2 = DC^2 + BD^2$ (6)

1.2.2 Calculate the area of the entire office space.

Formulae: Area = $\frac{1}{2}b \times h$ and Area = L × B (5)

1.2.3 A rectangular Area ABDE of the plan must be covered with square carpet tiles. The square carpet tiles comes in a shape of a square with a length of 600 mm each side.



(a) Convert 600 mm to metres. (1)

(b) Calculate the number of carpet tiles required to cover the Area ABDE. Include 4% for off-cuts. (7)

1.2.4 A triangular Area BCD of the plan must be painted. The paint comes in a cylindrical can with diameter (d) of 10 cm and a height (h) of 15 cm.



(a) Convert the diameter (d) and a height (h) to metres. (2)

(b) Calculate the number cans of paint required to paint the triangular Area BCD if one litre of paint can only cover a maximum area of 3 m^2.

Formulae: Volume = $\pi r^2 h$ where $\pi = 3,14$

1 000 ℓ = 1 m^3 or 1 mℓ = 1 cm^3 (7)

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QUESTION 2

2.1 The table below shows the income and expenses for renting a shop, buying stock and installing sets of satellite equipment for Television (TV) in local households.



To rent a shop costs a monthly amount of R6 000, 00 with water and electricity included.

It costs the shop R1 000,00 to buy equipment and install a set of satellite equipment per household.

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

No. of Satellite equipment installed	0	1	2	4	6	8
Expenses in rand (R)	6000	7000	8000	10000	12000	**B**
Income in rand (R)	0	2000	**A**	8000	12000	16000

2.1.1 What will the monthly expense amount be if only one set of satellite equipment was installed per month? (1)

2.1.2 What will the monthly income amount be if only one set of satellite equipment was installed per month? (1)

2.1.3 Use any method to calculate the missing values of A and B in the table. (4)

2.1.4 Define what is meant by break-even point. (1)

2.1.5 After how many installations will the shop make a break-even? (1)

2.1.6 Write down the formula that you will use to calculate:

(a) The total income. (2)

(b) The total expenses. (3)

2.1.7 Use the formulae in QUESTION 2.1.6 to calculate:

(a) The total income for installing 35 sets of satellite equipment. (2)

(b) The total profit for installing 35 sets of satellite equipment (4)

2.1.8 Use a grid provided in the ANSWER SHEET to draw and label Income and Expenses graphs of the shop on the same system of axis. (7)

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2.2 The following table compares the bank transaction fees of two banks. Use the information provided in the table to answer the questions that follow:

Transaction	Bank Fees	
	Bank A	**Bank B**
Monthly fee	R110	R85
Cash withdrawal (own bank's ATM)	R4,56 + R1,35/100	R1,80 per R100
Cash withdrawal (another bank's ATM)	R10,95 + R1,35/100	R7,80 + R1,80 per R100
Cash withdrawal at branch	R10,95 + R1,35/100	R26 + R1,80 per R100
Cash deposit (own ATM)	R4,56 + R1,35/100	R1,80 per R100
Cash deposit at branch	R26,00 + R1,40/R100	R30 + R1,80 per R100

2.2.1 How much would it cost to withdraw R5 600 from Bank A's own ATM? (3)

2.2.2 Determine the difference between the bank fees of Bank A and Bank B if you deposit an amount of R16 000 at the branch? (5)

2.2.3 Calculate the transaction fee for a cash withdrawal of R400 from another bank's ATM for Bank B. (3)

2.2.4 Which is a better bank for a client use? Give a reason for the answer. (3)

[40]

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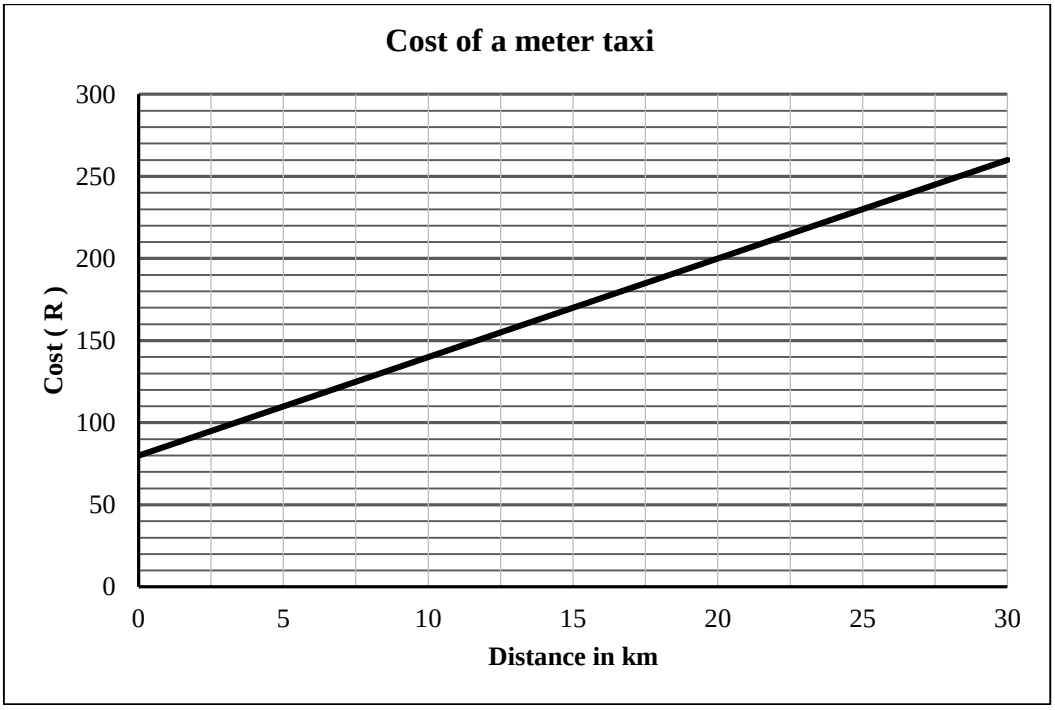
QUESTION 3

3.1 Kabelo has been invited for interviews. He will use a meter taxi to travel to where the interviews are conducted. The graph given below shows tariffs provided by a meter taxi.



3.1.1 Is the relationship of the graph a direct or indirect proportion? Give a reason for the answer. (2)

3.1.2 How much is the initiation fee of the taxi before the actual travel start? (2)

3.1.3 How much does the taxi company charge for a 20 km travel? (2)

3.2 Kabelo has been offered two employment posts. One is as a Software Developer and the other as an IT Freelancer.

The formula for calculating the monthly salary for a Software Developer is:

$S = 5\,000 + (250 \times \text{number of days worked})$

The formula for calculating the monthly salary as an IT Freelancer is R750 per day for each day worked in a month.

3.2.1 Write down the formula that can be used to calculate the monthly salary of an IT freelancer (where N = number of days worked in a month). (2)

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3.2.2 Kabelo used a table with the average of 20 working days to determine which is a better option.

Copy the table and assist Kabelo to complete it.

Number of days worked	0	5	10	15	20
Software Developer Salary (R)	5000	6250			
IT Freelancer Salary (R)	0	3750			

(6)

3.2.3 Use the attached ANSWER SHEET to draw a two-line graph on the same system of axis to represent the salaries for both positions that Kabelo has been offered as per the table completed in QUESTION 3.2.2. (7)

3.2.4 Which of the two positions is a better option? Give one reason for your answer. (3)

3.3 Pamela starts a business where she imports clothes from Singapore and resells them to boutiques. She pays R5 000 for 50 T-shirts and she sells each T-shirt for R200. She spends R1 500 on marketing materials each month. Her monthly transport cost is R3 500.

3.3.1 Write the formula for her income from selling the T-shirts (where n = number of T-shirts sold). (2)

3.3.2 Write the formula for her cost against the number of T-shirts she sells. (3)

3.3.3 Will Pamela make a profit if she buys and sells 50 T-shirts in one month? Show all calculations. (6)

[35]

QUESTION 4

4.1 A lecturer gathered the information from students in his class and arranged it as shown in the table below.

Student	Height (m)	Weight (kg)	Age
Adam	1,64	88	19
Bongi	1,71	91	27
Claire	1,60	47	34
David	1,52	48	33
Enoch	1,71	63	22
Fiona	1,66	65	40
Gabriel	1,75	72	44
Hannah	1,64	70	55
Ignatius	1,80	56	59
Julian	1,76	82	18

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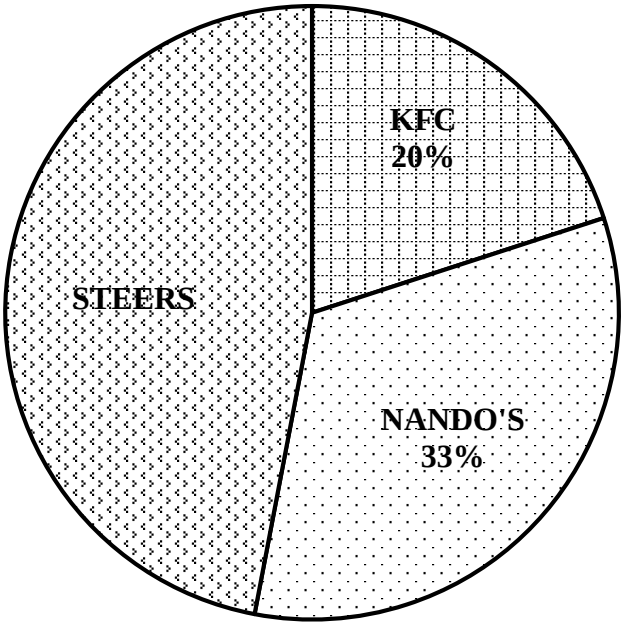
4.1.1 Use the table provided in ANSWER SHEET 2 to complete the frequency table of student data collected per age interval. (5)

4.1.2 Use the table in QUESTION 4.1.1 to construct and label a histogram using the ages of the students on a grid provided in ANSWER SHEET 2. (6)

4.1.3 Determine the mean weight of students. (4)

4.1.4 Determine the median of the ages of students. (3)

4.2 The pie chart below shows the distribution of 80 students and their favourite burger.



4.2.1 What percentage of the sample prefers KFC? (1)

4.2.2 What percentage of the sample prefers Steers? (3)

4.2.3 Determine the number of students who preferred KFC. (3)

4.2.4 If a student is selected at random, what is the probability of choosing someone who prefers KFC? (3)

4.2.5 If a student is selected at random, what is the probability of selecting someone who prefers Nando's or Steers? Express the answer as a decimal fraction. (3)

4.2.6 If 20 more students were included in the survey, and from the additional 20 students, 10 of them chose KFC and the other 10 chose Nando's, what will the new percentage of students that chose Nando's be? (4)

[35]

TOTAL : 150

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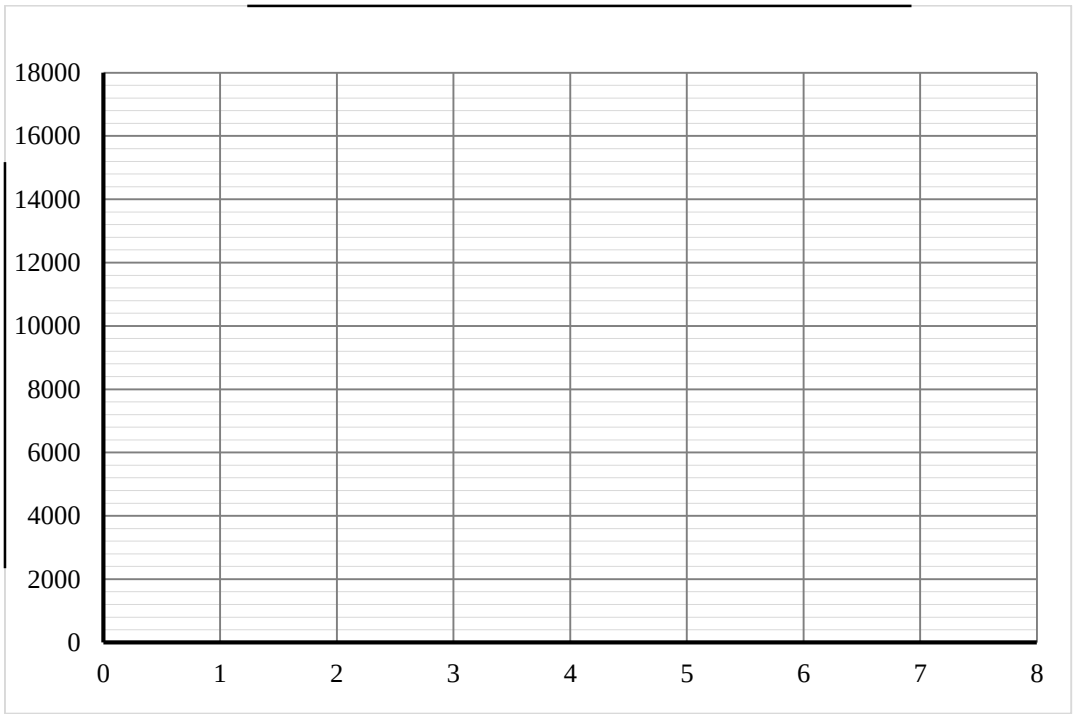
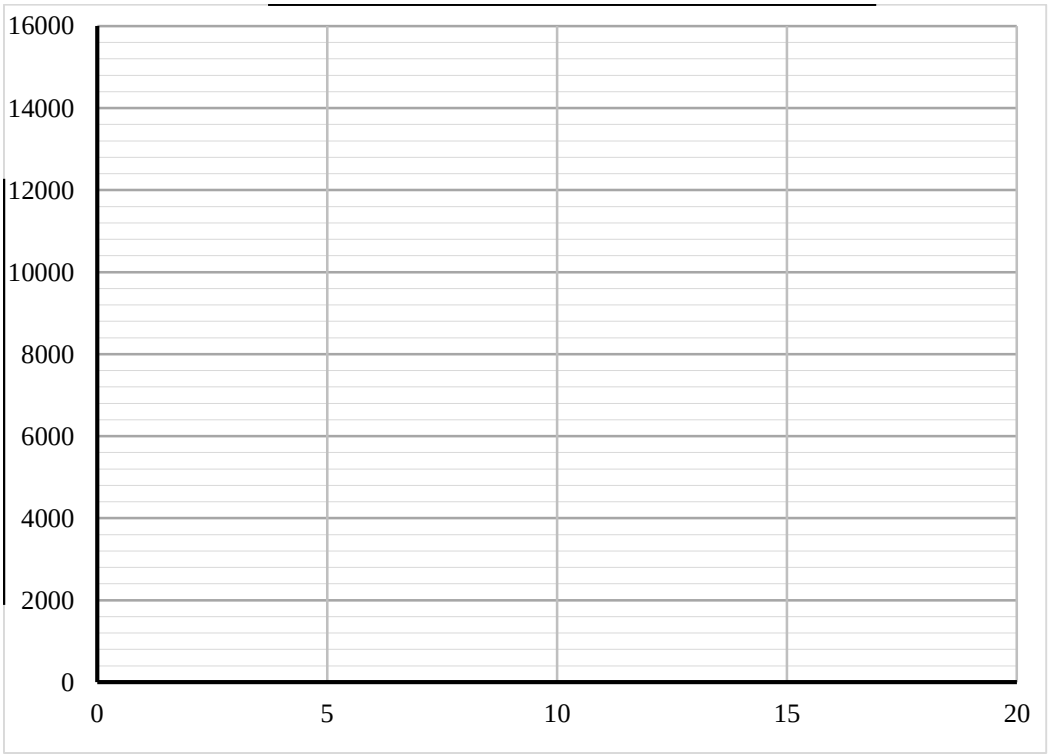
ANSWER SHEET 1 **EXAMINATION NUMBER:**

2.1.8



3.2.3



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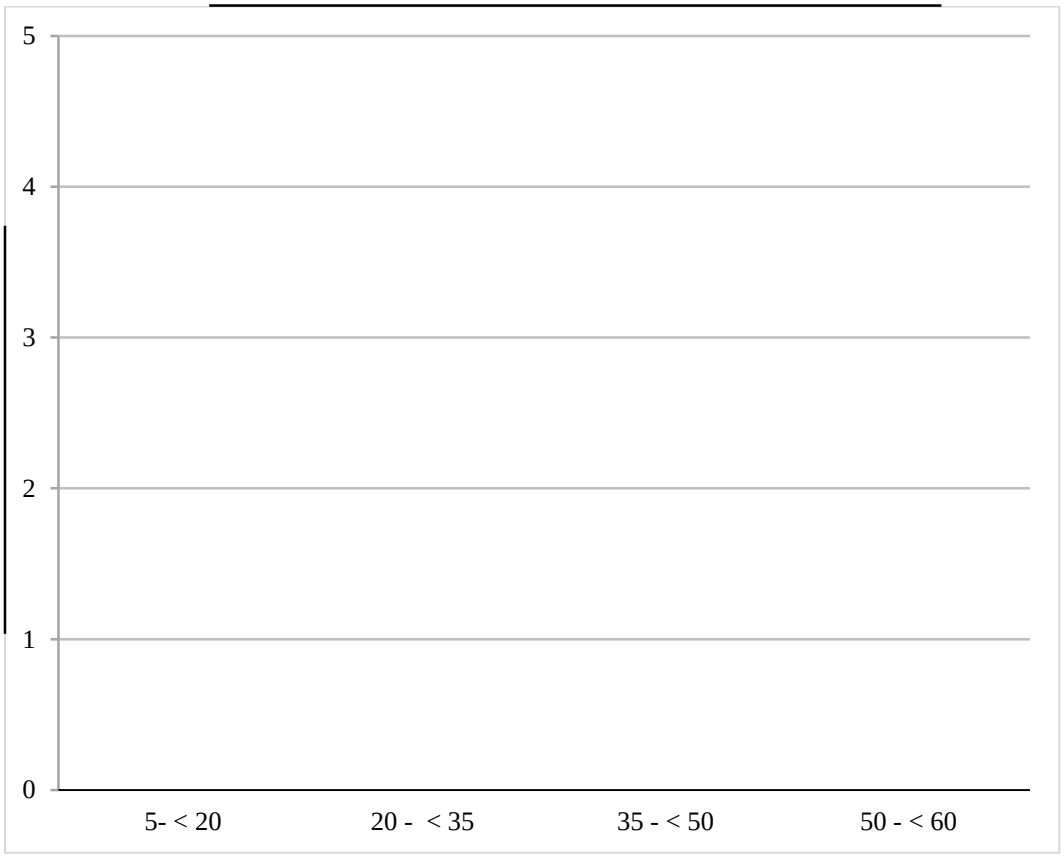
ANSWER SHEET 2 **EXAMINATION NUMBER:**

4.1.1

AGE INTERVAL	TALLY	FREQUENCY
< 20		
20 – < 35		
35 – < 50		
50 – < 60		
TOTAL		

4.1.2



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