Candidate Name	Centre Number	Candidate Number

ZIMSEC
For Performance Measurement

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

PHYSICS **4023/3**

PAPER 3 Practical Test 2 hours

JUNE 2025 SESSION

Candidates answer on the spaces provided on the question paper.

Additional materials:
As listed in Instructions to Supervisors
Mathematical set
Electronic calculator

FOR EXAMINER'S USE	
1	
2	
TOTAL	

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Record all your observations and answers in the spaces provided on the question paper.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [ ] at the end of each question or part question.

This question paper consists of 8 printed pages.

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1 In this experiment, you will determine the mass of a uniform metre rule.

(a) **(i)** Balance the metre rule horizontally on the pivot and record the position of the centre of mass.

position of the centre of mass _____ [1]

(ii) Set up the apparatus as shown in **Fig 1.1.**

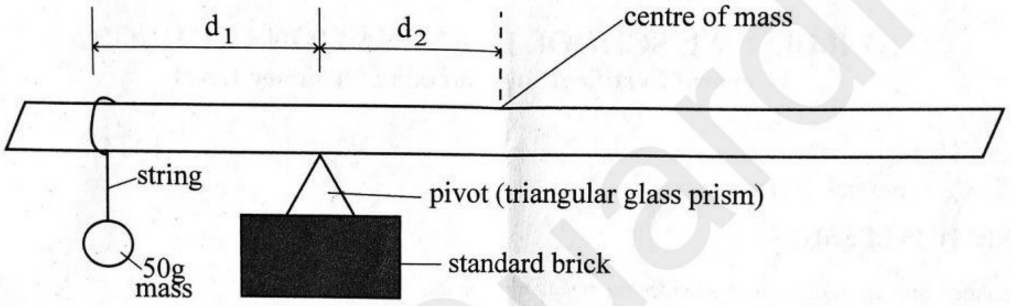


Fig 1.1

(b) **(i)** Place the 50 g mass on the 5 cm mark of the metre rule. Slide the metre rule on the pivot until it balances horizontally.

(ii) Measure distance d_1 and d_2 and record the readings in **Table 1.1.**

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(iii) Repeat **b(i)** and **b(ii)**, placing the 50 g mass on the positions shown in **Table 1.1.**

Table 1.1

Position to hang 50g mass	$d_1(\ldots)$	$d_2(\ldots)$
5 cm mark		
10 cm mark		
15 cm mark		
20 cm mark		
25 cm mark		
30 cm mark		

[8]

(c) **(i)** Calculate the average of values of d_1 (d_{1av}).

[2]

(ii) Calculate the average of values of d_2(d_{2av}) .

[2]

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(d) It is given that, $d_{1\,av} = \frac{m}{50} d_{2\,av}$, where m is a constant.

(i) Calculate the value of *m*.

[2]

(ii) State the significance of *m*.

_____ [1]

(e) State **one** source of error in this experiment and explain how it can be reduced.

_____

_____ [2]

(f) **(i)** Measure and record the mass of the metre rule using an electronic balance.

Record the mass of the metre rule.

mass of metre rule _____ [1]

(ii) Comment on the values obtained in **d(i)** and **f(i).**

_____

_____ [1]

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2 **(a)** In this experiment, you will investigate how the resistance, R, of a thermistor depends on its temperature, θ.

Pour the hot water into the beaker.

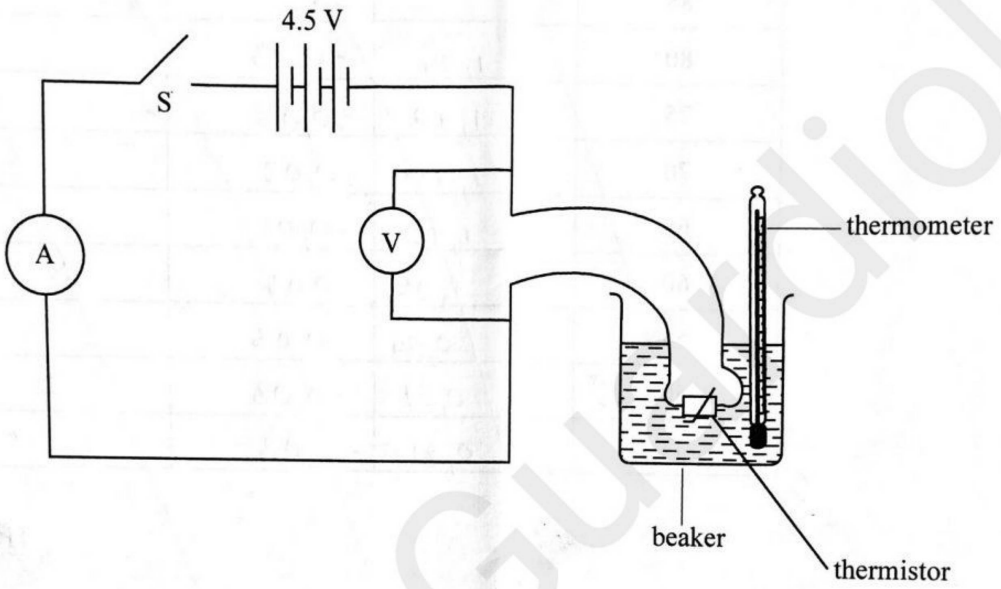


Fig.2.1

(b) **(i)** Connect the circuit as shown in **Fig.2.1.**

(ii) Stir the water continuously using a thermometer and record the values of I and V in Table 2.1 when the temperature is at 85 °C.

(iii) Repeat **b(ii)** at 5 °C interval as the temperature falls until it gets to 45 °C.

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(c) **(i)** Calculate the values of resistance, R to complete **Table.2.1**.

Table.2.1

θ/°C	I/mA	V/V	R/Ω
85			
80			
75			
70			
65			
60			
55			
50			
45			

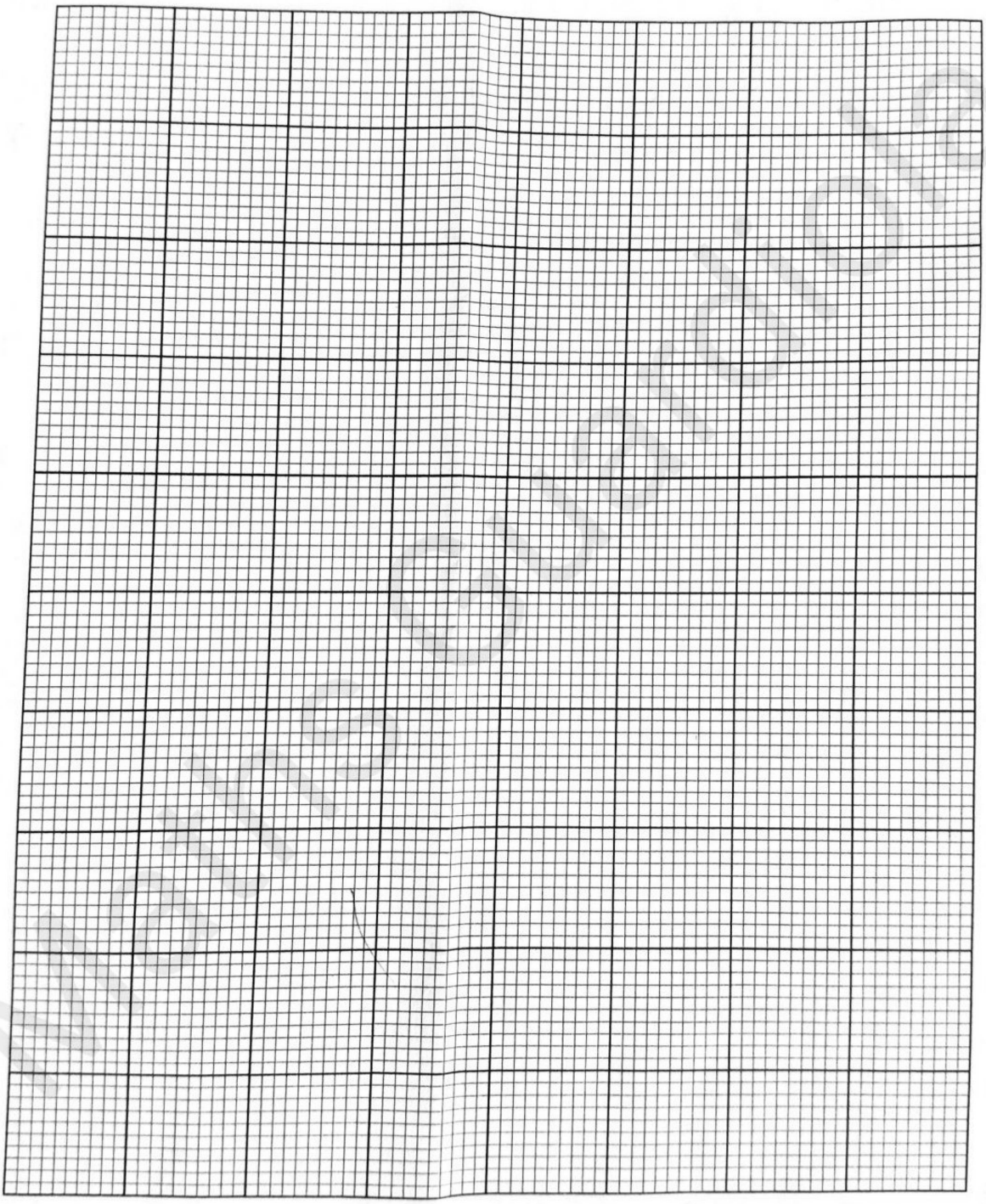
[10]

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(ii) Plot a graph of R (y-axis) against $\theta(x - axis)$.



[5]

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(iii) Using the graph, find the resistance when the temperature is 62° C.

R = _____ [2]

(d) Draw a conclusion from this experiment.

_____ [1]

(e) State any **two** precautions made during the experiment.

_____

_____ [2]

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