

Name:..... Index No.....

232/3

Candidate's Signature:.....

PHYSICS

PRACTICAL

Date:.....

PAPER 3

JAN 2021

TIME: $2\frac{1}{2}$ HRS

KASSU JET EXAMINATION.

Kenya Certificate of Secondary Education (K.C.S.E.)

232/3

PHYSICS

Paper 3

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided.
- Mathematical tables and non-programmable calculators may be used.
- This paper consists of three questions.
- Attempt all the questions in the spaces provided.
- ALLOW working MUST be clearly shown.

For Examiners Use

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1	20	
2	20	
TOTAL	40	

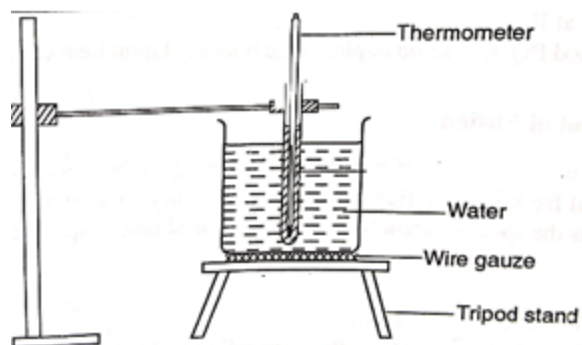
This paper consists of 11 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing

QUESTION ONE

Apparatus

- stopwatch
- 250ml beaker
- Rubber bung
- Thermometer
- Bunsen burner
- Tripod
- Gauze
- Retort stand and clamp
- Hot water

Figure 2.



Procedure

- (a) (i)** Measure and record the ambient temperature, $T_A = \dots\dots\dots^\circ\text{C}$ (1 mark)
(ii) Fill an empty beaker with exactly 150ml of hot water (check the side scale of the beaker)

(iii) Set up the apparatus as shown in **figure 2**. Ensure the thermometer is about 2cm above the bottom of the beaker.

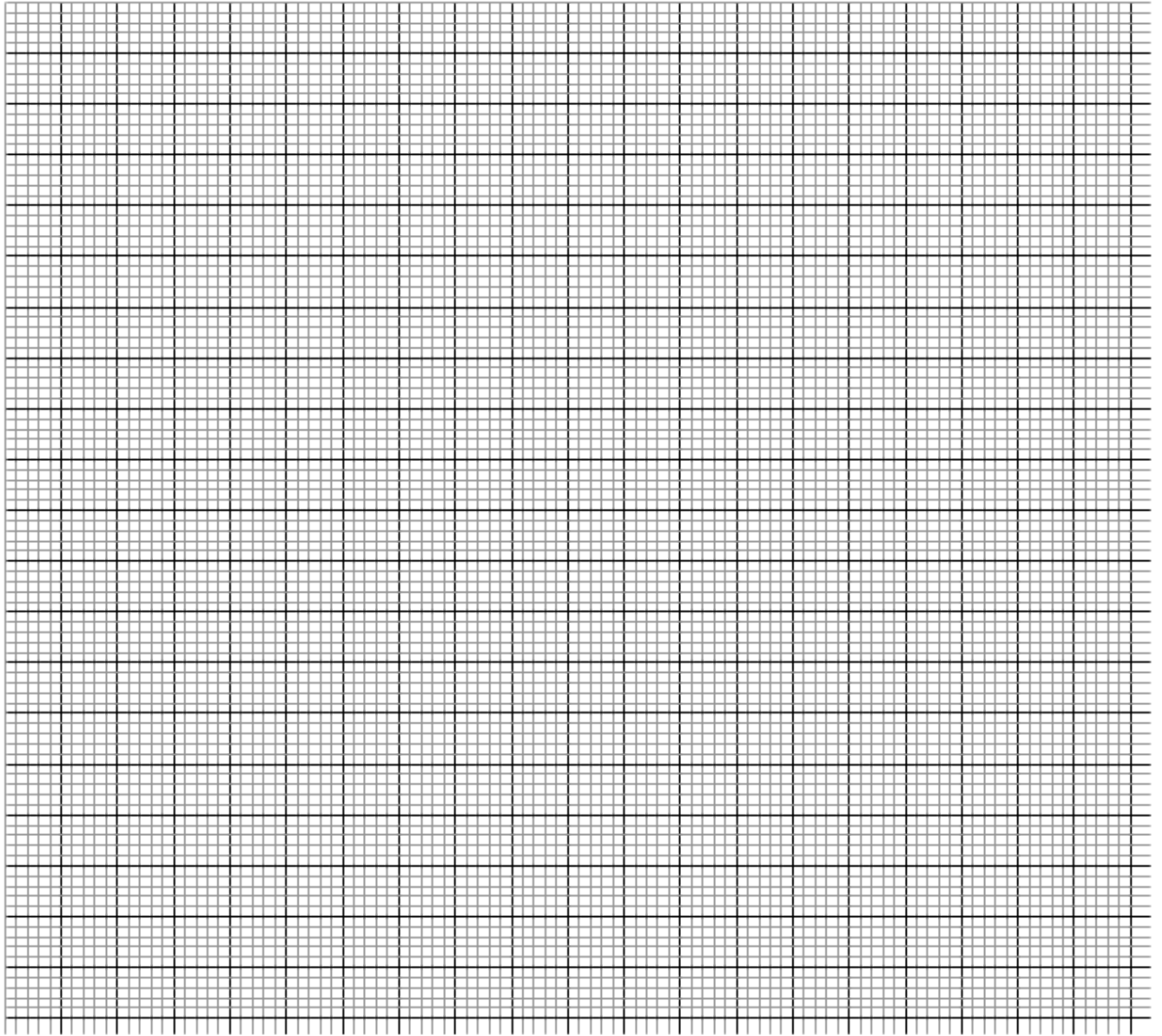
(i) Record the initial highest temperature of water $T_H = \dots\dots\dots$ $^{\circ}\text{C}$ (1 mark)

(b) Start the stopwatch and time for every 2.0 minutes the temperature T of water. Record the temperature in **Table 2** for 14 minutes

Time (t) in minutes	2	4	6	8	10	12	14
Temperature (T) in $^{\circ}\text{C}$							
$(T - T_A)^{\circ}\text{C}$							
$\text{Log}_{10}(T - T_A)$ (2 d.p)							

(6 mark)

(c) Plot a graph of $\text{Log}_{10}(T - T_A)$ against time (Hint: $\text{Log}_{10}(T - T_A)$ should start at 1.0) (5 mark)



(d) From the graph determine:

(i) The Slope S

(3marks)

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(ii) The cooling constant , K of water given $S = -0.4343K$ (2 mark)

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(e) Given that the specific heat capacity of water is $4.2J/g/^{\circ}C$ determine the heat lost when the water cools to the temperature of the surrounding (2 mark)

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2. PART A

You are provided with the following apparatus :

- One resistor labelled $R = 4.0\Omega$
- A wire labelled W mounted on milliammeter scale
- A wire labelled S mounted on a milliammeter scale
- One dry cell and a cell holder
- One jockey
- one centre zero galvanometer
- Eight connecting wires, four with crocodile clips at both ends
- A micrometer screw gauge
- A switch

Proceed as follows

- a) Determine the average diameter D, of the wire labelled W using the micrometer screws gauge provided.

$D_1 = \dots\dots\dots$ mm
($\frac{1}{2}$ mark)

$D_2 = \dots\dots\dots$ mm

(½ mark)

$$D = \frac{D_1 + D_2}{2} \text{ (in cm)}$$

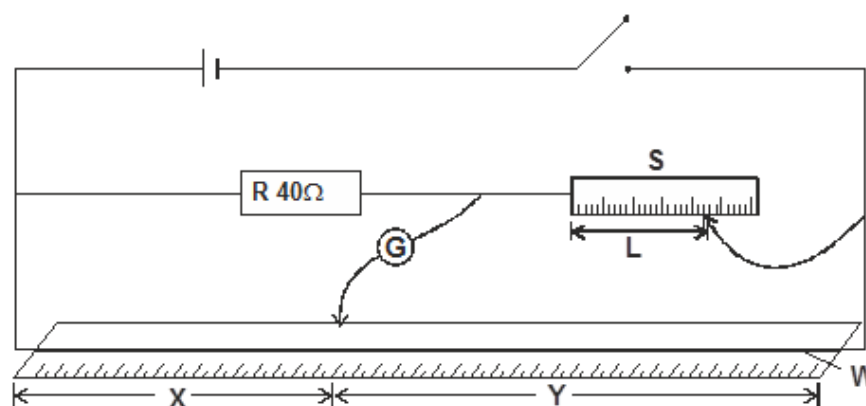
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(1 mark)

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b) Set up the apparatus as shown in the circuit diagram in **figure 3** below.

Use the crocodile clips to fix length L , of wire labelled S at 50cm from the end connected to the galvanometer G .



c) Close the switch and use the jockey to touch one end of the wire W , and then the other end. The deflections on the galvanometer should be in opposite directions, if not check the circuit. Adjust the positions of the jockey along the wire W until there is no deflection in the galvanometer. Record the value of x and y .

$x = \dots\dots\dots$ cm
(½ mark)

$y = \dots\dots\dots$ cm
(½ mark)

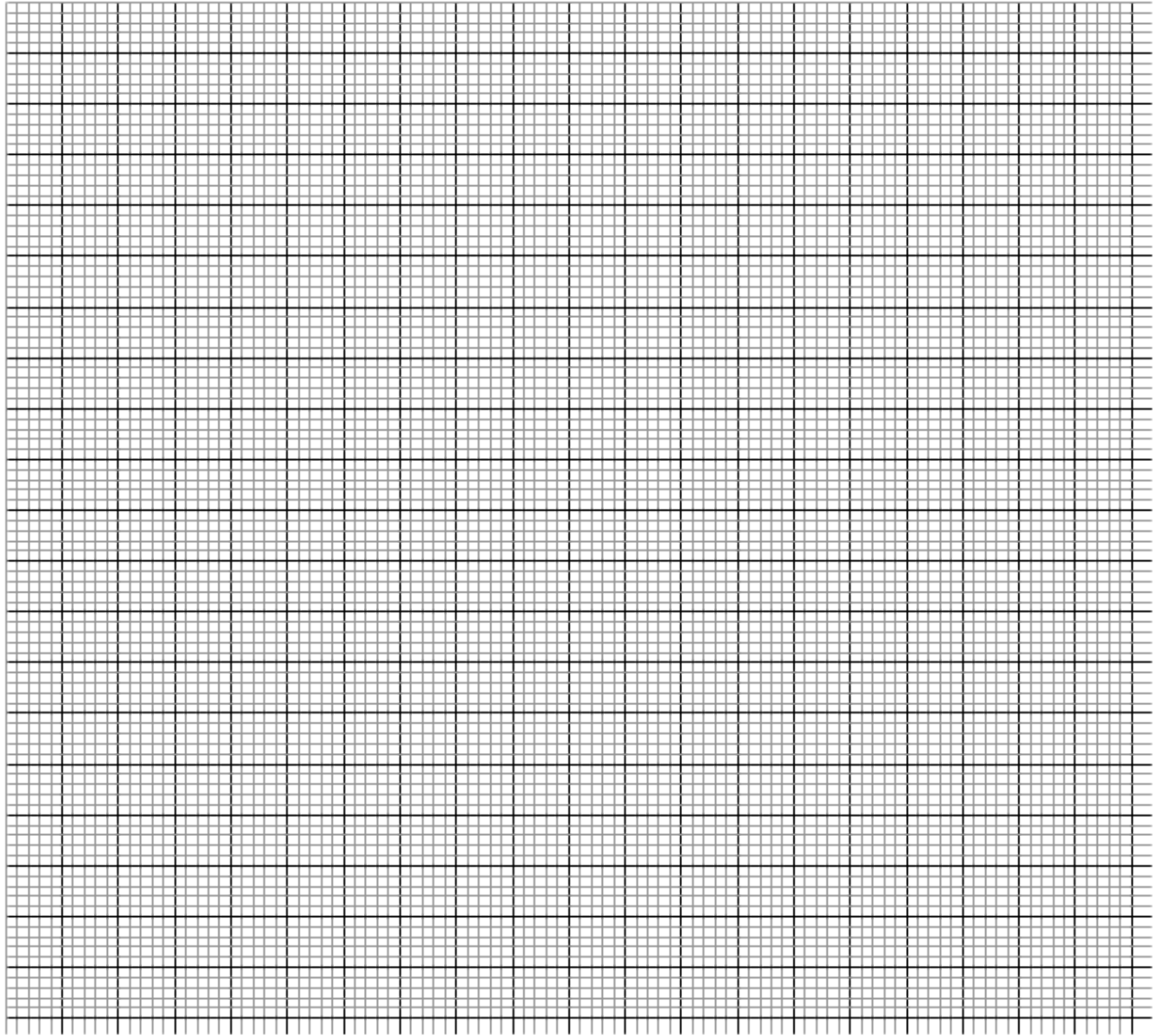
d) Record for other values of L in **table 3** below

L (cm)	45	40	35	30	25	20
X (cm)						
Y (cm)						
y/x (3 d.p)						

(4 marks)

e) i) Plot a graph of y/x (y-axis) against L.

(5 marks)



ii) Determine the slope, m of the graph.

(2 marks)

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iii) Given that $K = \underline{\hspace{1cm}}\pi D^2$, determine the value of K .

(2 marks)

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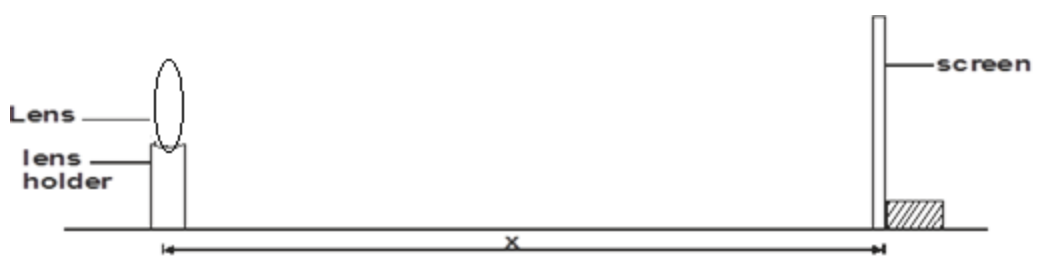
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PART B

b) You are provided with a lens P a lens holder a white screen and half metre rule.

Procedure

i) Set the apparatus as shown in **figure 4** below. Focus a sharp image of a distant object on the screen (e.g window frame). The object should be 10cm away. The object should be at least 10cm away.



a) Measure the distance x in cm between the lens and the screen at which a sharp image is obtained repeat this two times, using different objects and record your readings in **table 4** below.

Object	Distance X, (cm)
1	
2	

(2 marks)

ii) Calculate the average value of x (1 mark)

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iii)What is the physical significance of the result obtained in (iii) above? (1 mark)

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