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PAPER 3	, at the	
JULY/AUGUST 2014	5 5	

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231/3 PHYSICS PAPER 3 (PRACTICAL) JULY/AUGUST 2014 TIME: 2¹/₂ HOURS

KURIA WEST SUB-COUNTY JOINT EXAMINATION - 2014

Kenya Certificate of Secondary Education PHYSICS PAPER 3 (PRACTICAL) TIME: 2¹/₂ HOURS

Instructions to candidates:

- 1. Write your name and index number in spaces provided above.
- 2. Sign and write the date of examination in spaces provided above.
- 3. Answer all the questions in spaces provided in the question paper.
- 4. You are **NOT** allowed to spend the first 15 minutes of 2¹/₂ hours allowed for this paper reading the whole paper carefully before commencing the work.
- 5. Marks are given for clear record of the observations actually made, their suitability, accuracy and the use made of them.
- 6. Candidates are advised to record their observations as soon as they are made.
- 7. Non-programmable silent electronic calculators and KNEC Mathematical table may be used.

Question 1	а	С	f(i)	f(ii)	f(iii)		Total	20
Maximum Score	1	8	5	3	3			
Candidate's Score								

FOR EXAMINER'S LISE ONLY

Question 2	c(i)	c(i)	c(ii)	c(iii)	c(iv)	Part II b(i)	b(ii)	Total	20
Maximum Score	1	2	5	2	1	2	2		
Candidate's Score									

Grand Total



- 1. You are provided with the following.
 - A millammeter.
 - A voltmeter.
 - A wire mounted on a mm scale
 - A switch.
 - A long wire with a crocodile clip at one and (crocodile clip to be used as a slider or jockey).
 - A new dry cell (size) and a cell holder.
 - A micrometer screw gauge (may be shared).
 - 5 connecting wires, two with crocodile clips at the end.

Proceed as follows:

For More Fret

(a) Measure the diameter, d of the mounted at three different points.

Average diameter d = _____mm

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



- (c) Close the switch and tap the mounted wire with the crocodile clip as shown in the circuit. Ensure that both meters show positive deflection. Open the switch.
- (d) Tap the wire at L = 20cm. Close the switch read and record in the time provided the milliammeter and voltmeter reading.
- (e) Repeat the procedure in (c) for other values of L, shown in the table below and complete the table. (8mks)

L(cm)	L(m)	V (Volts)	I MA	Amps	$R = \frac{V}{I}$
20					
30					
40					
50					
60					
80					

(f) (i) Plot the graph of R (Y-axis) against L(m).

(5mks)

(1mk)

Physics Paper 3



(ii) Determine the slope of the graph.

(3mks)

(iii) Given that $R = \frac{PL}{A}$ were A is the cross-sectional area of the wire and P is a constant for the material of the wire, determine the value of the constant P. (3mks)

- 2. You are provided with the following:
 - A marble with a piece of thread attached.

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- CTwo wooden blocks.
- Clamp, boss and retort stand.
- Meter rule.

FOT NOTE

- $\frac{1}{2}$ metre rule attached to a wooden block.
- Cello tape (2 pieces of about 10cm long)
- Stop watch.

Proceed as follows:

- (a) Fix the thread between the two wooden blocks and fasten the clamp.
- (b) Adjust the thread so that the length L shown in figure 1 is 50.0cm. Fix the metre rule horizontally to the bench using the cello tape provided.
- (c) Adjust the clamp so that the marble is next to the end of the metre rule as shown.



- (i) Displace the marble by a horizontal distance X = 20cm and measure the corresponding vertical.
 Displacement h = _____ cm (1mk)
- (ii) Repeat the experiment to find h for each of the following values in the table. (Complete the table). (2mks)

χ(cm)	h(cm)	χ ² (cm ²)	$\chi^2/_{\rm h}(\rm cm)$
20		200	
25		625	
30		900	
35		1225	
40		1600	
45		2025	



(2mks)

From the graph, find the value of $\frac{t^2}{h}$ when h = 0. (1mk)

> (b) Raise the clamp slightly without changing the length L so that the marble is free to swing. Determine the period, T, for one complete oscillation by timing ten oscillations.

Time for 10 oscillation =	(1mk)
Period T =	(1mk)

Calculate the value of P from he following equation. (c)

$$T = 2f \sqrt{\binom{P}{g}}$$
 where g = 9.8ms⁻² (2mks)

- 2. (b) You are provided with the following apparatus:
 - Candle
 - Lens
 - Lens holder
 - Metre rule
 - Cross wire
 - Screen
 - Vernier calipers

Proceed as follows:

(i) Arrange the apparatus as shown in the figure **2 below**.

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- (ii) Place the cross-wire before the lens so that U = 28cm. The lit candle should be placed close to the cross-wire.
- (iii) Adjust the position of the screen until a sharp image is cast on the screen.
- (iv) Measure and record the value of image distance, V, in the table.
- (v) Repeat the same procedure for the other values in the table.

Table 2

U(e	cm)	V(cm)	$M = \frac{V}{U}$	
30				
36				(2mks)

(vi) Given that the focal length f of the lens satisfies the equation $f = \frac{V}{1+M}$ determine average value of the focal length, f. (3mks)