

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

Class..... Adm No.....

232/3  
Physics  
Paper 3  
July/August 2014  
Time:  $2\frac{1}{2}$  hours

**ALLIANCE GIRLS HIGH SCHOOL MOCK EXAMINATIONS**  
Kenya Certificate of Secondary Education  
**PHYSICS**  
**PRACTICAL**

Time:  $2\frac{1}{2}$  hours

Answer all questions on the question paper.  
You are supposed to spend the first 15 minutes allowed for this paper reading the whole paper carefully before commencing your work and confirming your apparatus.  
Marks are given for a clear record of the observations actually made, (or their suitability and accuracy, and for the use made of them.)  
Candidates are advised to record observations as soon as they are made  
Mathematical tables and Electronic calculators may be used.

**FOR EXAMINERS USE ONLY**

**QUESTION 1**

	a(i)	a(ii)	a(iii)	d	e	f(I)	f(II)	g(i)	g(ii)	h
Maximum Score	1	1	2	4	5	2	1	1	1	2
Candidate's Score										

Total

**QUESTION 2**

	c	d	e	f	g(i)	g(ii)
Maximum Score	8	5	3	2	1	1
Candidate's Score						

Total

Grand Total

### QUESTION 1

#### Apparatus

- A voltmeter (0 –3V), Two cell holders
- An ammeter (range 0 –1A),
- Two dry cells
- A resistance wire on mm scale labeled AB
- A potentiometer
- Eight connecting wires, two with crocodile clips
- Access to a micrometer screw gauge (can be shared).

#### Proceed as follows:

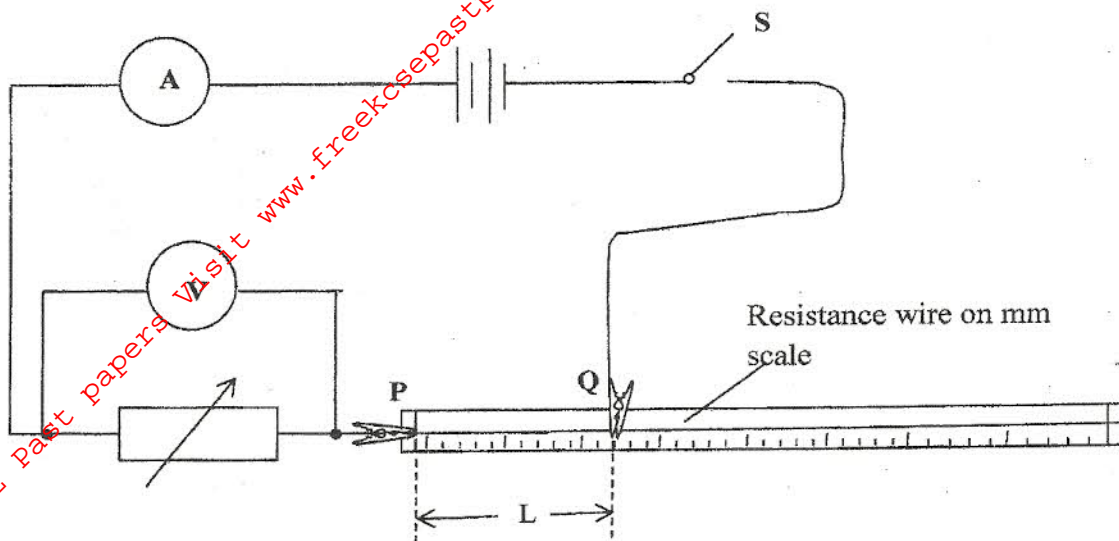
- a) (i) Using the micrometer screw gauge provided measure and records the diameter  $d$  of the resistance wire AB

.....m (1 mark)

- (ii) Calculate the cross-sectional area  $A$  of the wire, using the formula  $A = \frac{\pi d^2}{4}$  (1 mark)

- (iii) Hence calculate the value  $\rho$  given that  $R = \rho \frac{L}{A}$  where  $R=7.2\Omega$  and  $L=1.0$  m (2 mark)

- b) Set up the circuit as shown in in the diagram. There are two crocodile clips labeled **P** and **Q**. **P** will remain in the same position throughout the experiment while **Q** can be moved to different positions along the resistance wire.



c) Starting with  $L=0.1\text{m}$ , close switch **S** and adjust the variable resistor so that current flowing through the circuit  $I = 0.2\text{A}$  (the ammeter reading). Read and record the voltmeter reading in the table. **Note: This value of current must remain constant throughout the experiment.** This is achieved by adjusting the variable resistor for each value of  $L$ .

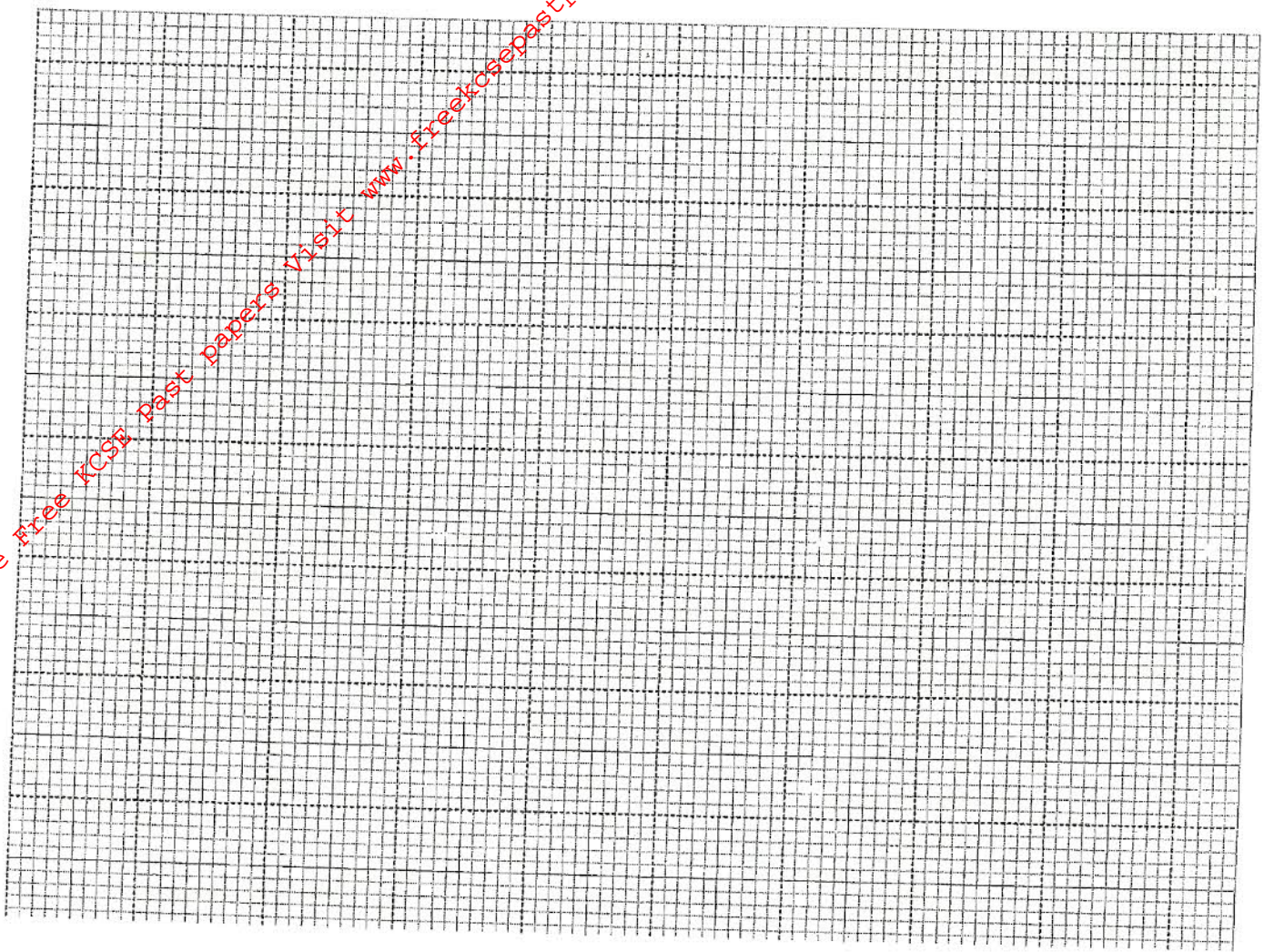
d) Repeat procedure (c) for other values of  $L$  as indicated in the table. Complete the table

$L(\text{m})$	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
$V(\text{volts})$								
$\frac{V}{L}(\text{Vm}^{-1})$								
$\frac{1}{L}(\text{m}^{-1})$								

(4 marks)

e) Plot a graph of  $\frac{V}{L}$  (y-axis) against  $\frac{1}{L}$  (5 marks)

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(f) From the graph determine;

I. The gradient. (2 marks)

II.  $y$ -intercept (1 mark)

g) The graph above is related by the equation  $\frac{V}{L} = \frac{Q}{L} - K$ . Use the graph to determine:

i. the value of Q (1 mark)

ii. the value of K (1 mark)

h) Hence calculate a constant  $\rho$  given that  $\rho = \frac{AK}{I}$  (2 marks)

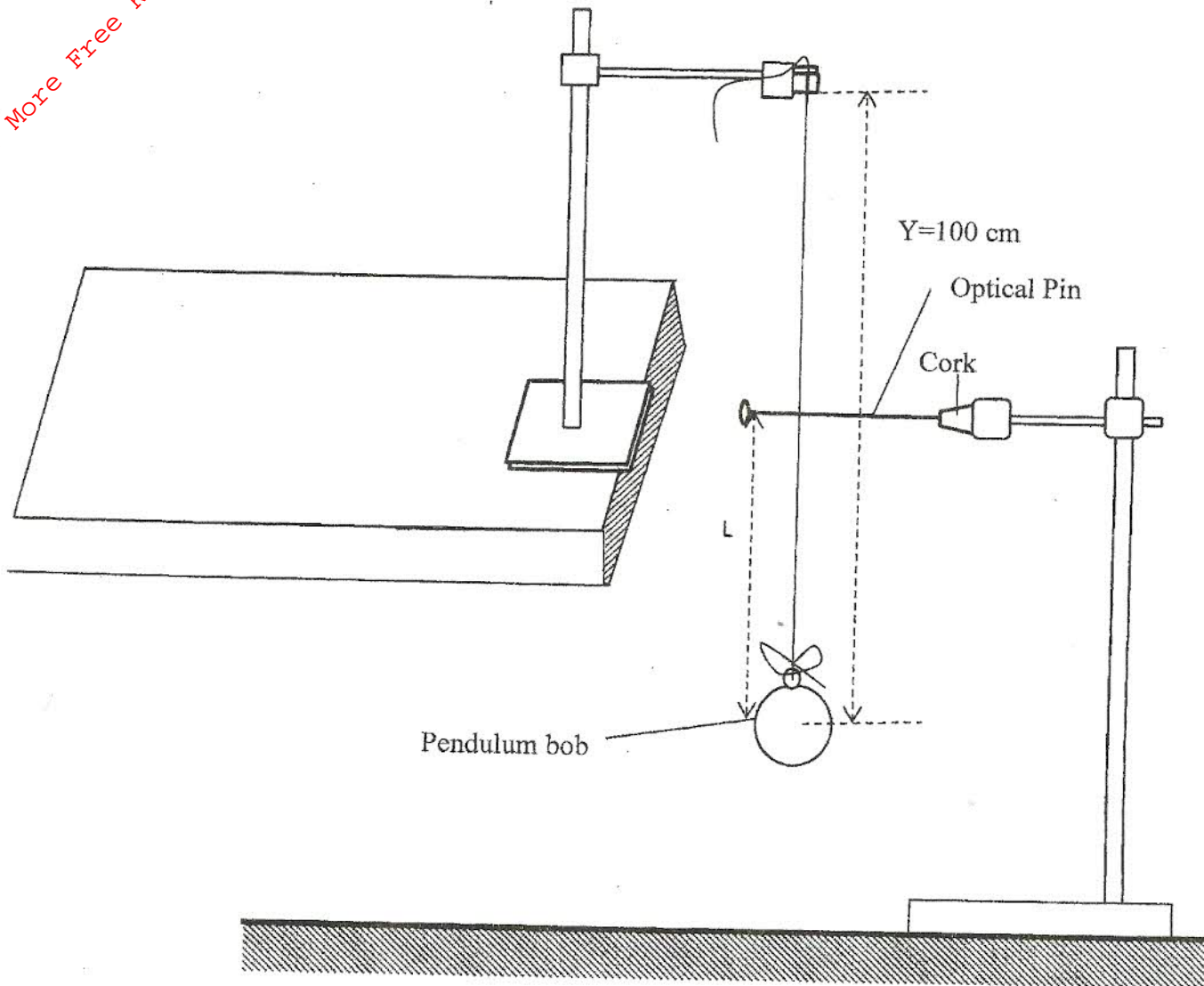
## QUESTION 2

You are provided with the following:

- ✓ a metre rule
- ✓ an optical pin fixed to a piece of cork
- ✓ two retort stands, two bosses and two clamps
- ✓ two wooden blocks
- ✓ a stop watch
- ✓ some thread tied to a pendulum bob

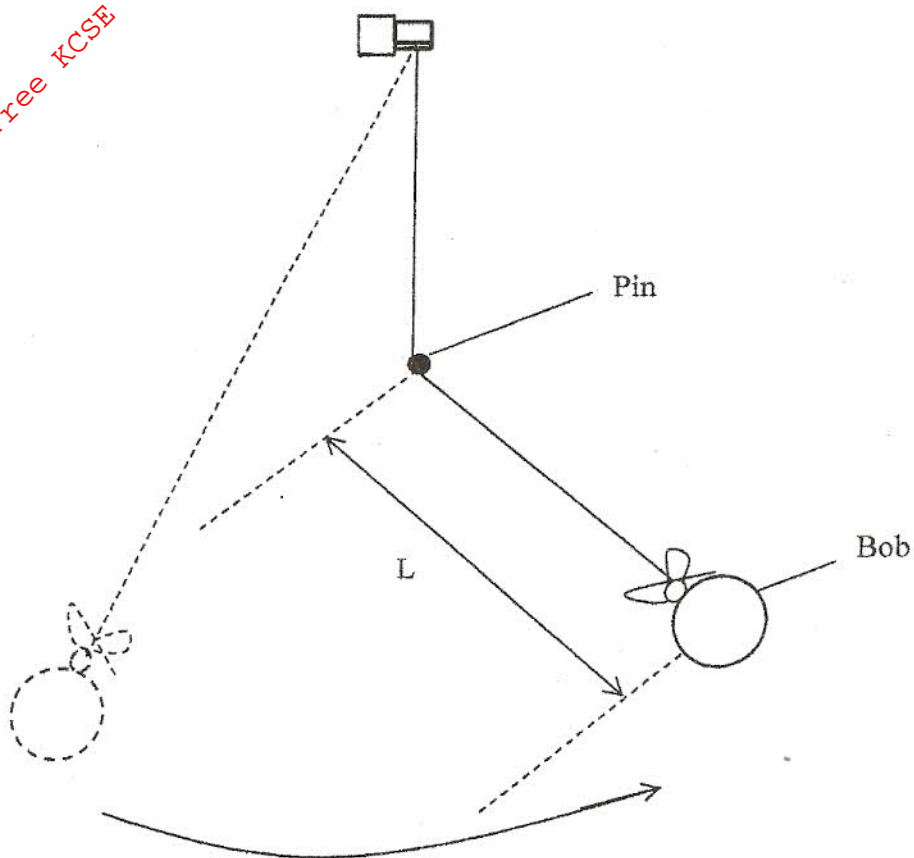
Proceed as follows

- a. Set up the apparatus as shown in the figure below.



b) The thread tied to the pendulum bob should be held firmly between the blocks of wood and clamped to the upper end of the stand so that the bob hangs freely. The distance  $Y$  between the points of support and the centre of the bob is 100 cm. Ensure that  $Y$  remains constant throughout the experiment. Adjust the lower clamp so that the pin just touches the thread when hanging pendulum bob is at rest.

c) Adjust the position of the lower clamp so that the pin is at a distance  $L = 30$  cm above the centre of the bob. Displace the bob slightly to one side and release it so that it swings in a plane perpendicular to the pin and the thread hits the pin as shown in the figure below.



d) Measure and record in table 1 the time  $t$  for 20 oscillations.

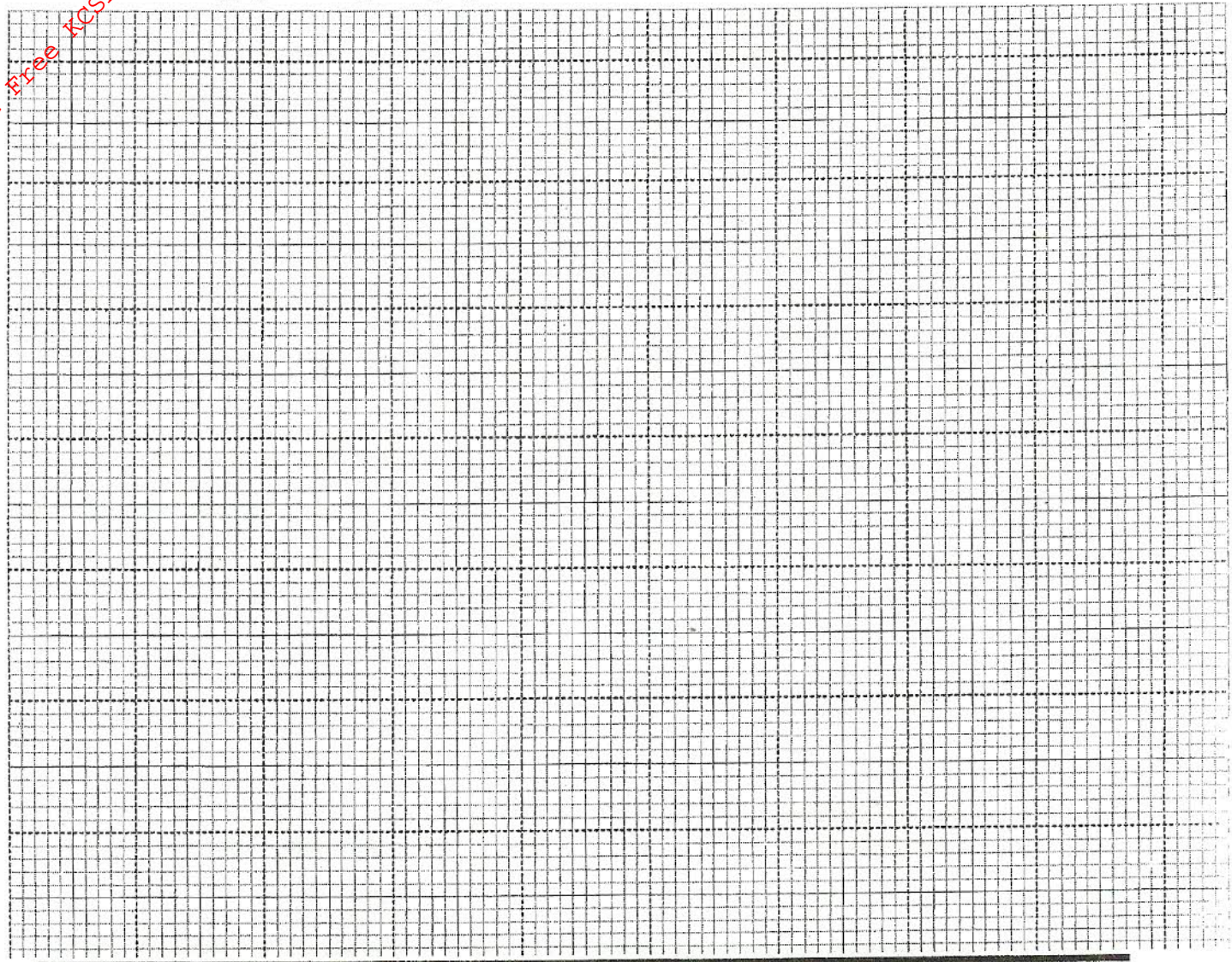
e) Repeat the procedure in (c) for other values of  $L$  shown in the table. Complete the table.

Distance L(cm)	30	35	40	45	50	55	60
Time t for 20 osc (s)							
$T = \frac{t}{20} (S)$							
$T^2 (S^2)$							

(8 marks)

On the grid provided

f) Plot the graph of  $T^2$  (y-axis) against L. (5 marks)





g) i) Determine the slope  $m$  of the graph

(3 marks)

ii) Determine the constant  $P$  given that  $P = \frac{4\pi^2}{m}$

(2 marks)

iii) Use the graph to determine the y-intercept value  $Q$

(1 mark)

iv) Determine the value constant value  $\eta = PQ$

(1 mark)