NAME ……..…… **DATE** ……

INDEX NO. …….……..….. **SIGNATURE** ….……..…..……..

232/3
PHYSICS
PAPER 3
PRACTICAL

TIME: 2 ¼ HOURS

INSTRUCTIONS TO CANDIDATES

- Write **your name** and **index number** in the spaces provided
- Answer **ALL** the questions in the spaces provided in the question paper.
- You are supposed to spend the first 15 minutes of the 2 $^{1}/_{4}$ hours allowed for this paper reading the whole paper carefully before commencing your work.
- Marks are given for clear record of observations made, their suitability, accuracy and the use made of them.
- Candidates are advised to record their observations as soon as they are made.
- **Non-programmable** silent electronic calculators and KNEC mathematical table may be used.
- This paper consists of 7 printed pages. Candidates should check to ensure that all pages are printed as indicated and no questions are missing

FOR EXAMINER'S USE ONLY

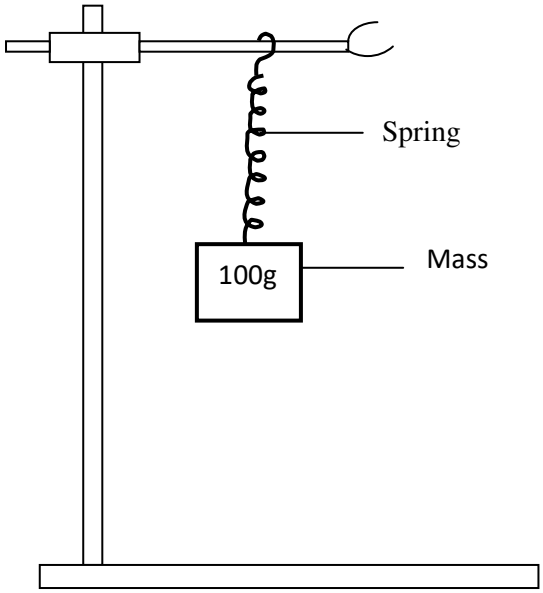
QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
1	20	
2	20	
TOTAL	40	

PART A

1. You are provided with the following:
   - A retort stand, clamp and boss.
   - A spiral spring.
   - A stop watch.
   - Three 100g masses.
   - Three 50g masses.

   PROCEDURE

   a) Suspend a 100g mass at the end of a spiral spring as shown below.



   b) Now give the mass a small vertical displacement and release so that it performs vertical oscillation.

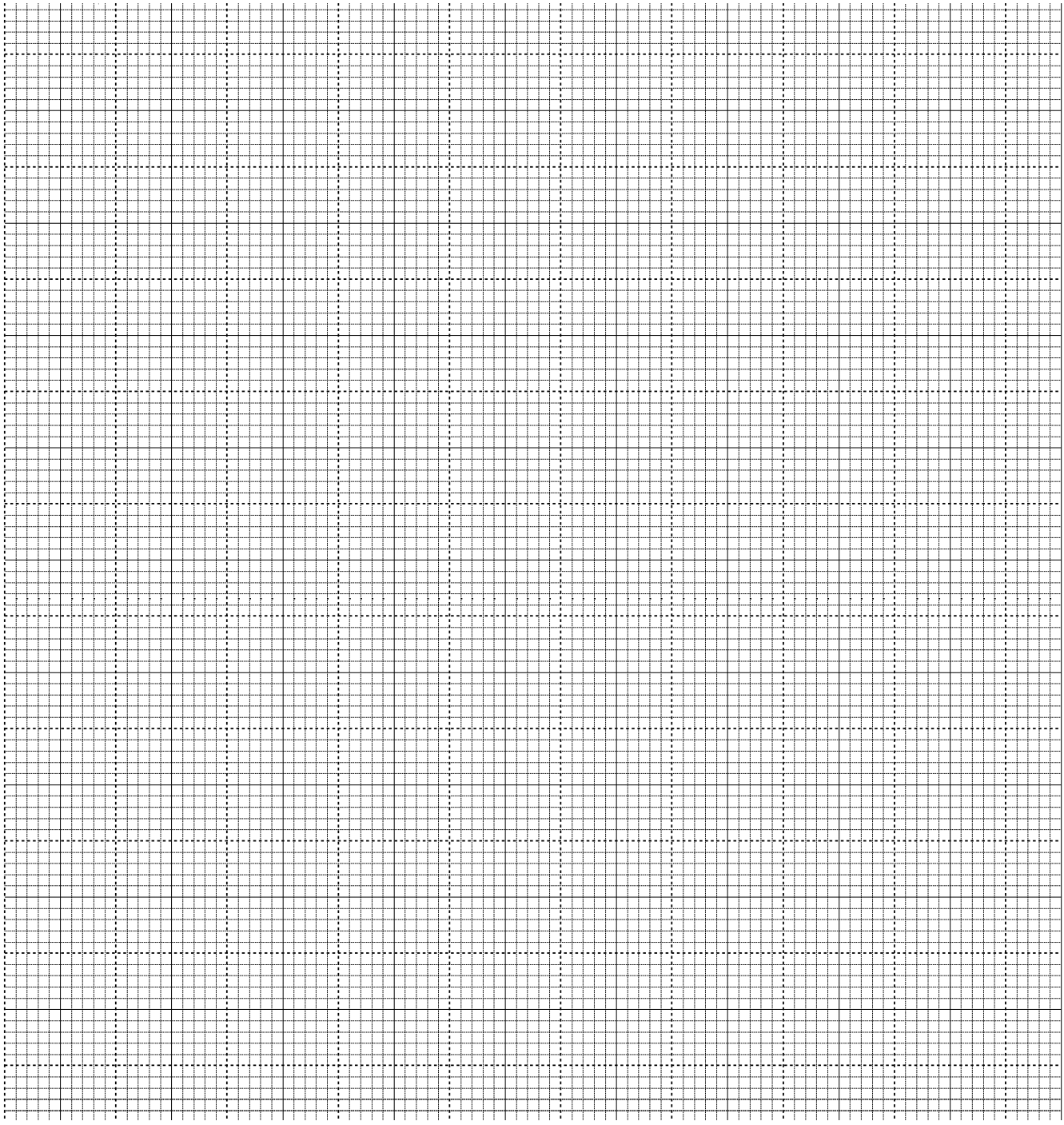
   c) Time for 20 oscillations and determine the period.
   Enter the result in the table below.

   d) Repeat the experiment for other values of mass given and complete the table.

Mass m(g)	100	150	200	250	300	350
Time for 20 oscillations t (s)						
Period time T (s)						
T^2 (S^2)						

6marks

e) Plot a graph of T^2 (S^2) (y –axis) against m (kg). (5marks)



f) Determine the slope of the graph. (2marks)

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g) Given that $T^2 = \pi^2 m$ where k is the spring constant , use the graph to obtain the value of the spring constant k. k (2marks)

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PART B

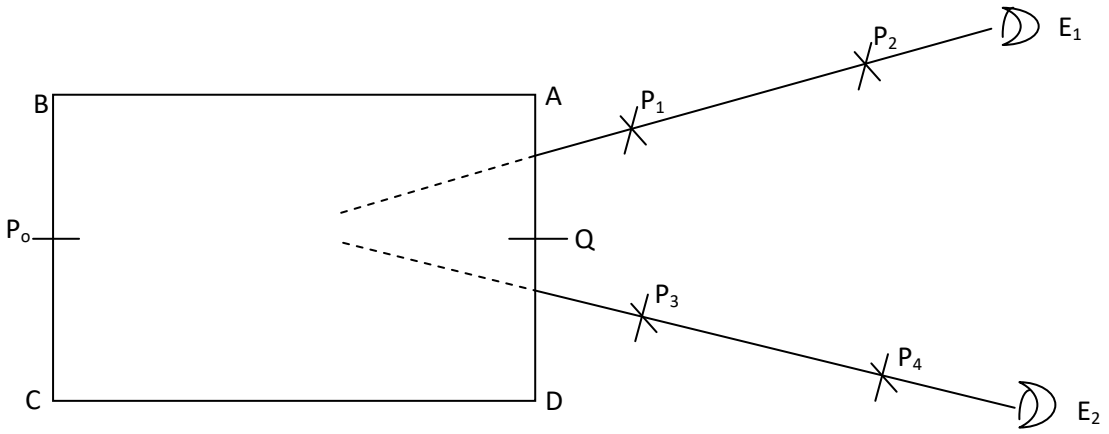
You are provided with the following

- 5 optical pins
- A rectangular glass block
- A plain paper
- A soft board
- 4 thumb pins

Proceed as follows

h) Fix the white piece of paper on the soft board using thumb pins. Place the glass block on the white paper and draw the outline of the block.

i) Remove the glass block and indicate the sides A, B, C and D as shown.



j) On side BC, determine its center and fix a pin P_0 as shown. Looking from one side at the opposite end of the slab, fix pin P_1 and then pin P_2 so that they are in line with the image I of the pin P_0 .On the other side locate the same image using pins P_3 and P_4 as shown above.

k) Remove the glass block and the pins and produce lines P_1P_2 and P_3P_4 to their points of intersection; (the position of the image I) (1mark)

l) Determine the midpoint of AD and label it Q. Measure the lengths QP_0 and Q1. (2marks)

QP_0 =.....cm

Q1 =.....cm

m) Work out the ratio $= \frac{QP_O}{Q1} = n$ (1mark)

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n) What does n represent (1mark)

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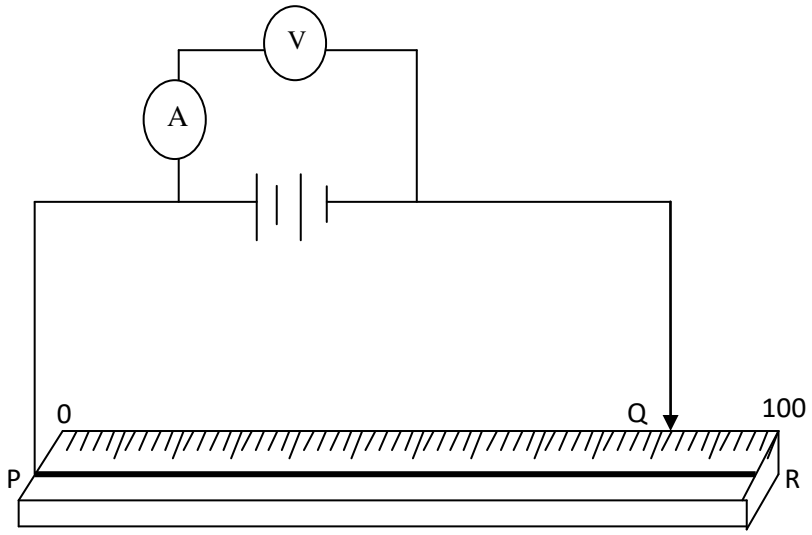
QUESTION 2

You are provided with the following

- Two dry cells
- A voltmeter
- A cell holder
- An ammeter
- Five connecting wires
- A nichrome wire mounted on a meter rule and labeled Q
- A jockey

PROCEED AS FOLLOWS

a) Set up the apparatus as shown



b) By disconnecting the jockey from the nichrome wire ,read and record the ammeter reading I and the corresponding voltmeter reading E. (2marks)

I=.....A

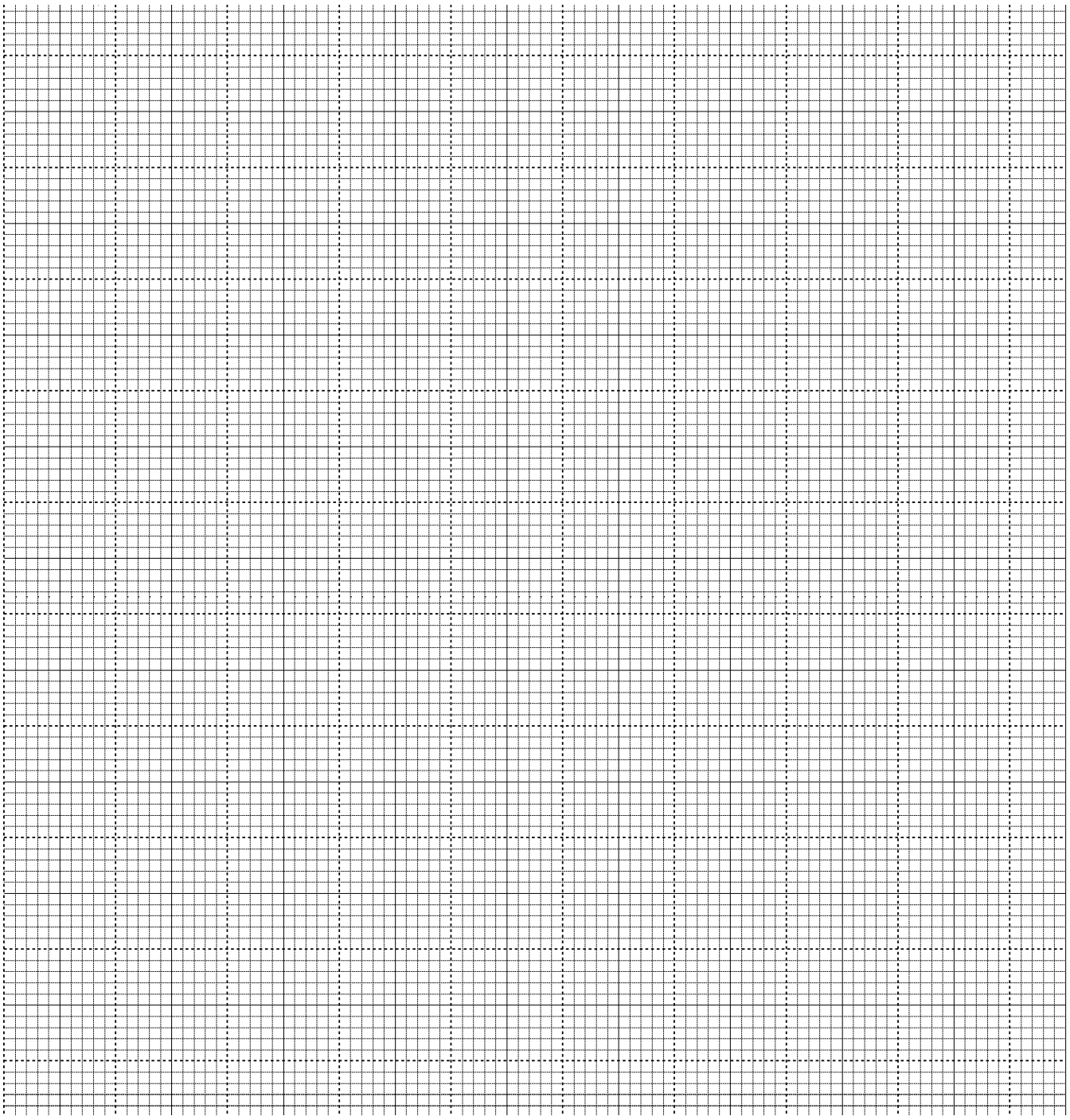
E.....V

c) With the jockey placed at the following lengths, read and record the ammeter reading and the corresponding voltmeter reading. Compete the table below.

Length L (cm)	70	50	40	30	20	10
P. d V (V)						
Current I (A)						

6mks

d) Plot a graph of potential difference V (y-axis) against current I , on the grid provided. (5marks)



e) Determine the slope S of the graph. (2marks)

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f) Given that the equation connecting V, E, I, and r is E= V +Ir, from the graph determine:

i) the e.m.f of one cell. (2marks)

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ii) the internal resistance of one cell (2marks)

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iii) the voltage p. d when current is 0.4 A (1mark)

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