NAME …… **DATE** ……

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

232/3
PHYSICS
PAPER 3
PRACTICAL
JULY / AUGUST, 2014
TIME: 2 $^{1}/_{4}$HOURS

MAKINDU DISTRICT INTER – SECONDARY SCHOOLS EXAMINATION

Kenya Certificate of Secondary Education

232/3
PHYSICS
PAPER 3
PRACTICAL
TIME: 2 ½ 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 6 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	

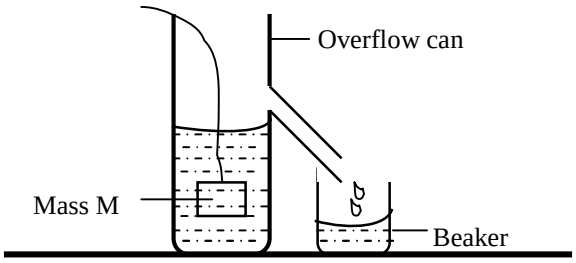
1. You are provided with the following apparatus
- A meter rule
- A wire of length at least 100cm
- A retort stand
- A stop watch
- a micrometer screw gauge
- An overflow can
- A 100ml beaker
- A 50ml measuring cylinder
- A piece of thread
- Water in a 250ml beaker
- Two pieces of wood
- Mass labeled m

PROCEDURE

a)

i. Fill an overflow can with water to overflowing and then let it drain.

ii. Immerse the mass m into the can. Collect the overflow water into a beaker as shown below.



iii. Using the measuring cylinder provided, determine the volume V of the water collected in the beaker

V=..... (1mark)

iv. Calculate I given that $I = \frac{10^6 m}{V}$ $where\ m = 0.30kg$ $(2mks)$

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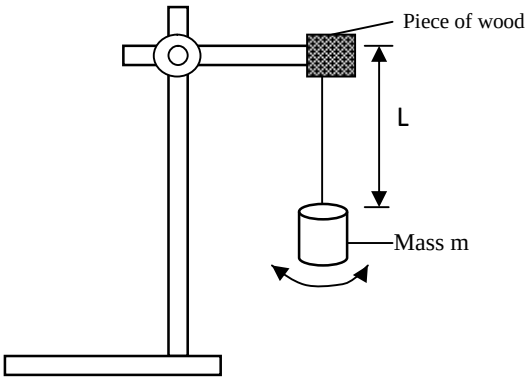
b) Set up the apparatus as shown below. Ensure that the wire is free of kinks and the end tied to the hook is firm and the hook does not move.



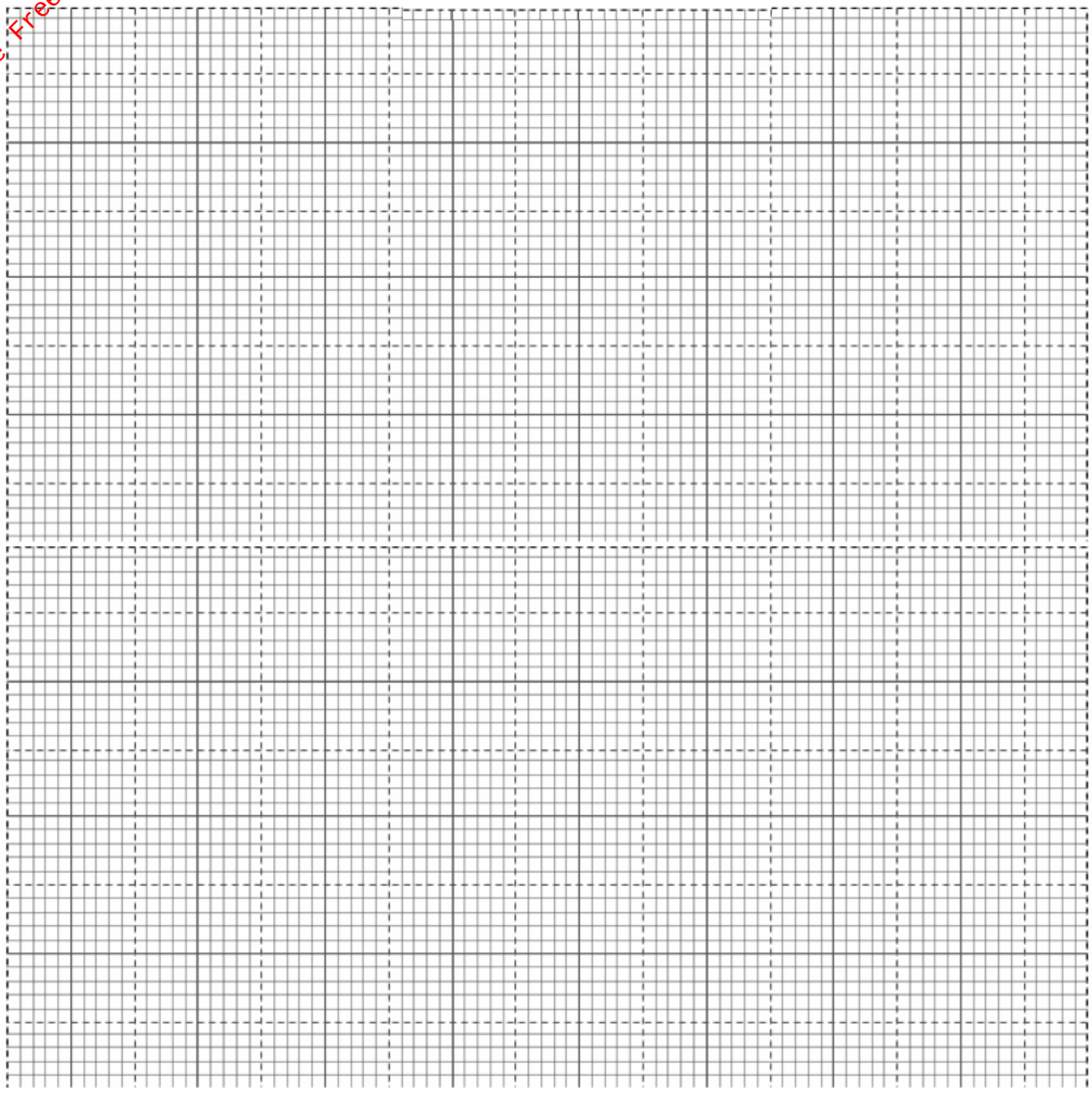
c) Adjust the length L of the wire so that L=70cm. Give the mass m a slight twist so that when released, it oscillates about the vertical as shown above. Measure the time t for twenty oscillations and record in the table below.

d) Repeat the procedure above for other values of L as shown and complete the table.

Length L (cm)	70	60	50	40	30	20
Length L(m)						
Time for 20 oscillation						
Period T(s)						
$T^2(s^2)$						

(5mark)

e) On the grid provided plot a graph of $T^2(s^2)(y-axis$ against L(cm) (5marks)



i. Measure the diameter of the wire

d=.....metre (1mark)

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

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iii. Given that $T^2 = \frac{4\pi^2 l}{Gd}$ determine the value of the constant G (3mark)

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PART TWO

You are provided with the following apparatus

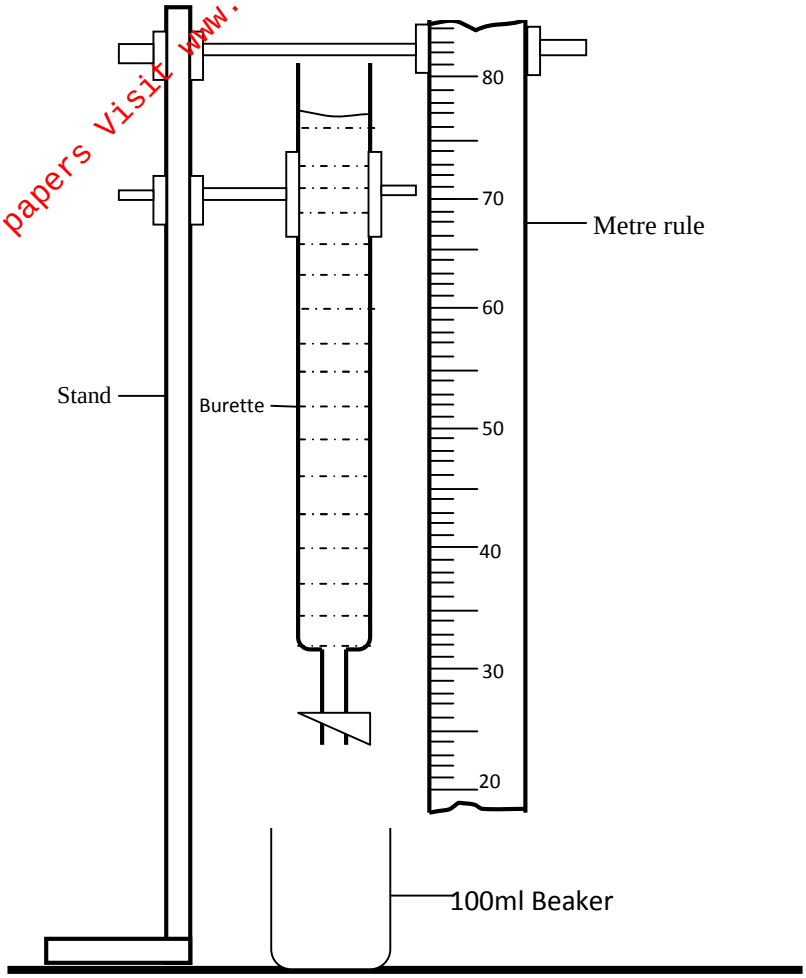
- A clean burette
- Retort stand
- Two clamps and 2 bosses
- A metre rule
- Water
- 100ml beaker
- A stop watch

PROCEDURE

a) Clamp the burette and metre rule vertically and as close to each other as possible

b) Adjust the position of the burette so that its lower end is 10cm above the bench and place the 100ml beaker underneath it.

c) Fill the burette with water to a height above the 70cm mark of the metre rule as shown below.



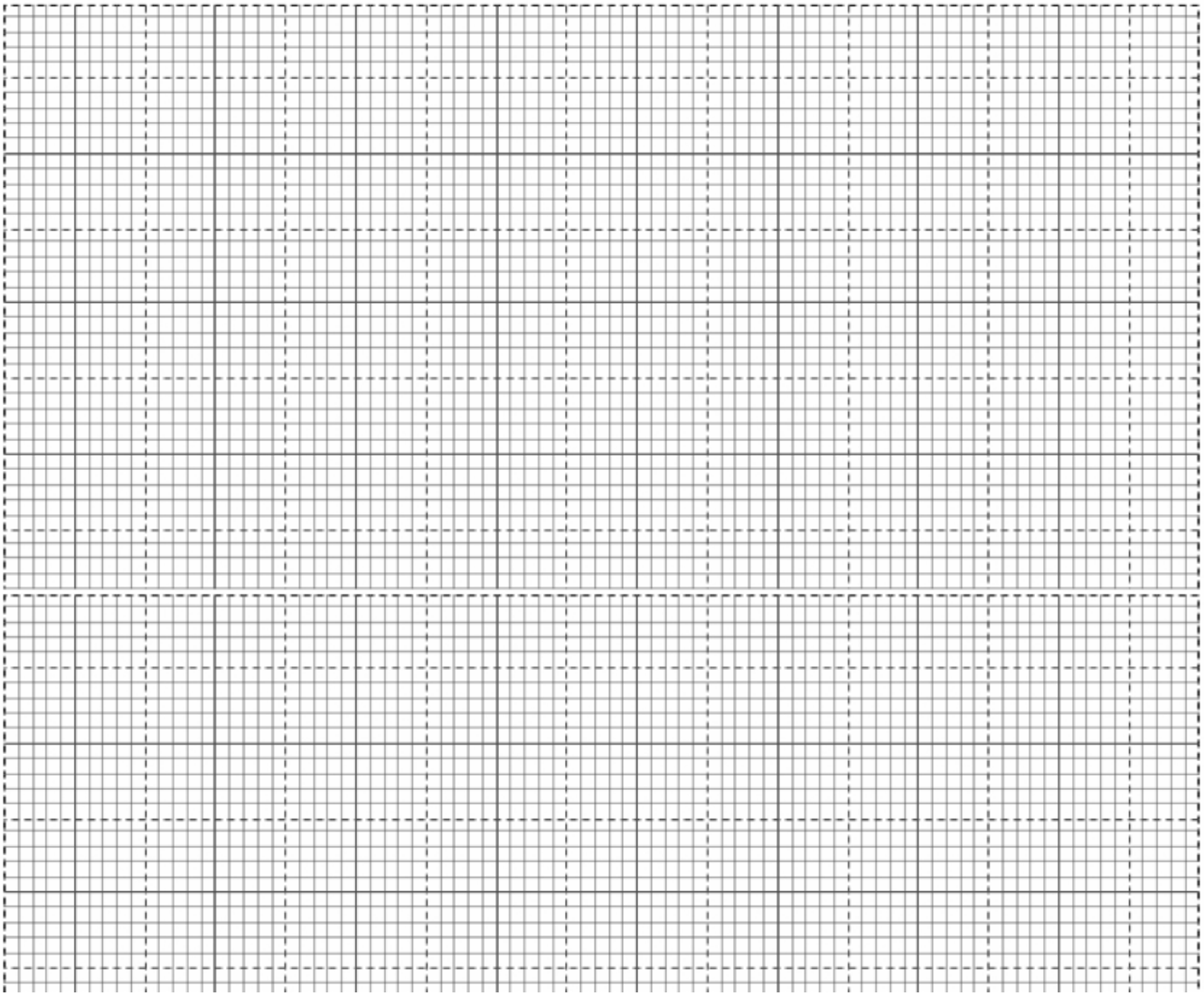
- By trial and error method adjust the rate of flow of the water until the time taken for the water to flow from 70cm mark to 65cm is between 25-30 seconds.
- Once this flow rate has been achieved do not alter the flow rate for the rest of the experiment.
- Fill the burette again with water to a level above the 70cm mark.
- With the water level at the 70cm mark (at t=0) start the stop watch. Note the time taken for the height h of the water surface in the burette to decrease by 5cm;Do not stop the watch.
- Continue to record the time taken for the height h of water surface to decrease by successive 5.0cm marks till you have 10 more readings.
- Enter the results in the table below
- Stop the watch and close the burette tap.
- Repeat the procedure to get second and third set of readings for t.

Height h(cm)	Time (s)			
	Trial 1	Trial 2	Trial 3	Mean time t
70				
65				
60				
55				
50				
45				
40				
35				
30				
25				
20				

(6marks)

Complete the table above and calculate the mean time t

c) Plot a graph of height h (y-axis) against mean time t (5marks)



d) Use your graph to determine the time taken for the height h to change from 64cm to 32cm. (2marks)

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e) From the graph determine the time t when h=35cm (1mark)

PART THREE

You are provided with the following apparatus

- 2 200g masses
- 2 pieces of thread
- A metre rule
- A beaker
- A knife edge
- A vernier calipers
- Liquid labeled L

PROCEDURE

f) Using the vernier calipers, determine the volume of the 200g mass provided. (2marks)

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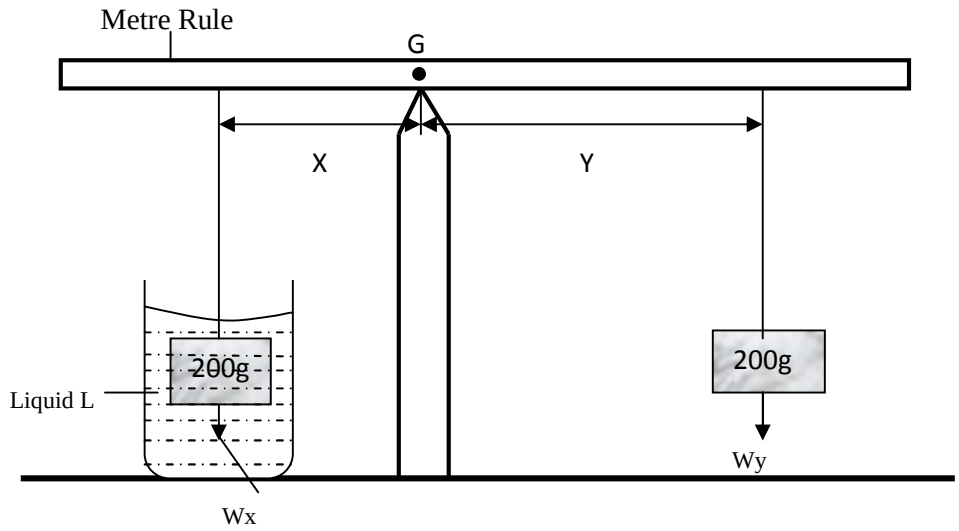
g) Arrange the apparatus as shown in the diagram below such that x=100mm from pivot (centre of gravity of the metre rule) with 200g mass completely immersed in liquid L and hang the other 200g mass from the metre rule and adjust its position until the system is in equilibrium.



i) Determine the distance y in mm

Y=..... (1mark)

Given that $\frac{Y}{X} = \frac{WX}{WY}$ where W_x is the apparent weight of the mass in the liquid L and W_y is the actual weight.

Calculate the value of W_x and the up thrust U of the liquid (3marks)

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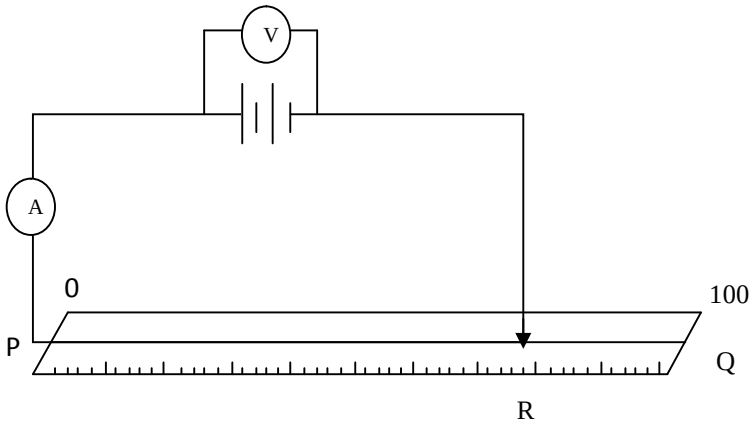
PART FOUR

You are provided with the following apparatus

- Two dry cells
- An ammeter
- A voltmeter
- A cell holder
- Five connecting wires
- A jockey
- A nichrome wire mounted on a mm scale labeled PQ

PROCEDURE

a) Set up the apparatus as shown below



Disconnect the jockey from the wire at point R and record the voltmeter reading V and the corresponding ammeter reading. (2marks)

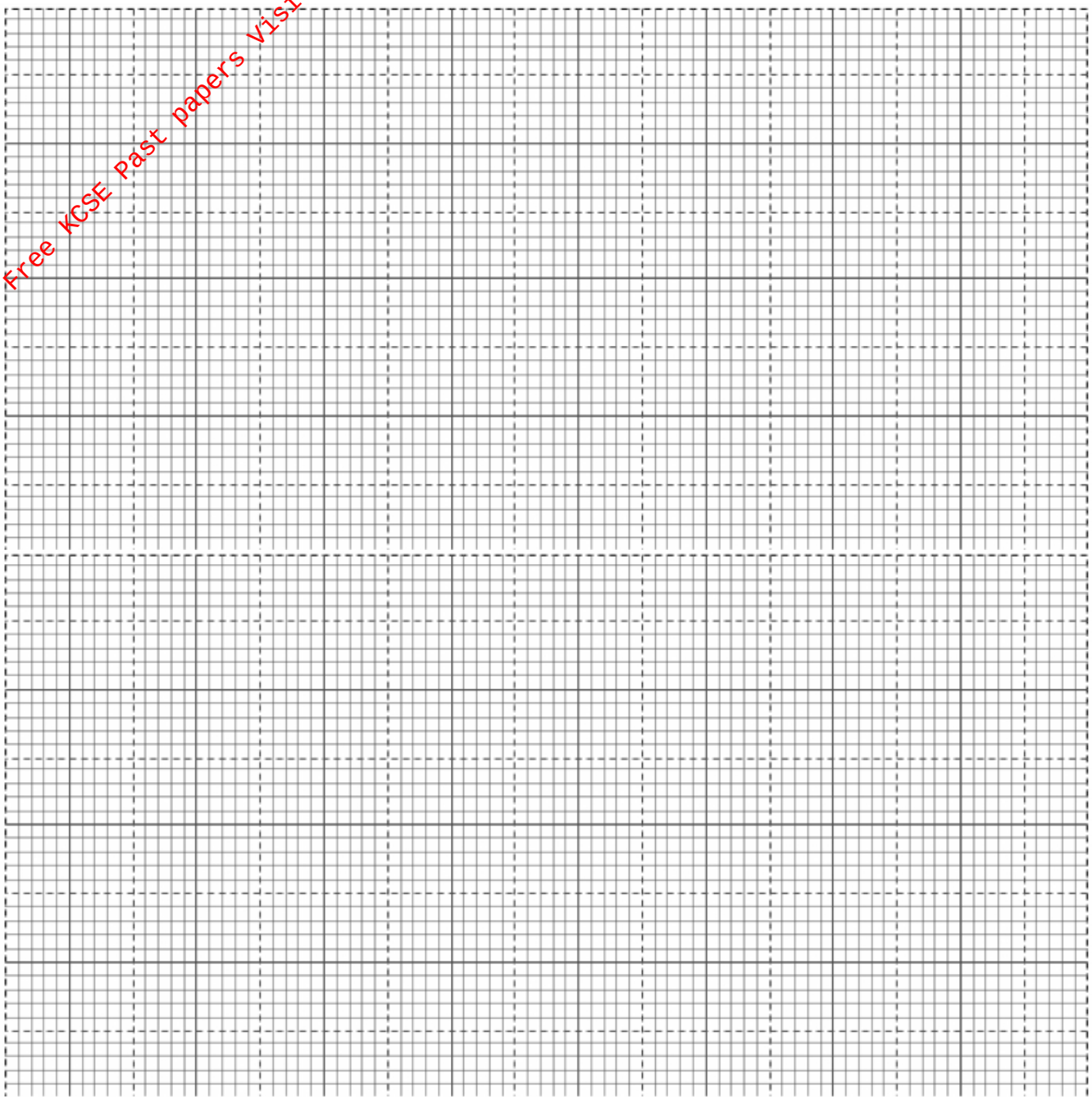
V =.....

I = ...

b) Now connect the jockey at the 70cm mark and record the voltmeter reading V and the corresponding ammeter reading in the table below. Repeat for values of V and J at the 50cm, 40cm, 30cm,20cm and10cm mark (6 marks)

Length cm	70	50	40	30	20	10
p.d (v)						
Current I(A)						

c) Plot a graph of p.d (v) against current I (5marks)



d) From the graph determine

a. The e.m.f of one cell (2marks)

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b. The internal resistance of one cell (3marks)

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c. The voltage p.d when current I=0.05A (1mark)

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d. The current I when the p.d voltage is 1.0V (1mark)

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