Name: …… Index No. ……

School: …… Candidate's Sign. …….....

Date: …….....

232/3

PHYSICS

PAPER 3

JULY /AUGUST 2018

TIME: 2 ½ HOURS

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

Physics Paper 3

INSTRUCTIONS TO CANDIDATES:

- *Write your **name** and **index number** in the spaces provided above.*
- *Sign and write the **date** of the examination in the spaces provided above.*
- *You are supposed to spend the first **15** minutes of the **2 ½** hours allowed for this paper reading the whole paper carefully before commencing your work.*
- *Marks are given for a clear record of the observation actually 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 **may be** used.*
- *Candidates should check the question paper to ascertain that all the pages are printed and that no questions are missing.*

For Examiners' Use Only

	Maximum score	Candidates score
QUESTION 1	**20**	
QUESTION 2	**20**	
TOTAL	**40**	

This paper consists of 6 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.

QUESTION 1

You are provided with the following;
- An ammeter
- A voltmeter
- Two cells (size D)
- A cell holder
- A switch
- A wire labelled L mounted on a millimeter scale
- A micrometer screw gauge (to be shared)
- Six connecting wires at least four with crocodile clips

Proceed as follows;

a) Using a micrometer screw gauge, measure and record the diameter **d** of the wire **L**.

d = ...mm

d = ...m (1 mark)

b) Place the two cells in series in the cell holder and use the voltmeter to measure the total electromotive force (emf) E_0 of the battery. (1 mark)

E_0= .....v.

c) Starting with the switch open, connect the circuit as shown in figure 1. P and Q are points on the wire **L** such that **PQ** is 60cm. (*PQ should remain 60cm throughout the experiment*) **N** is a point on the wire such that **PN** is 10cm (0.1m)

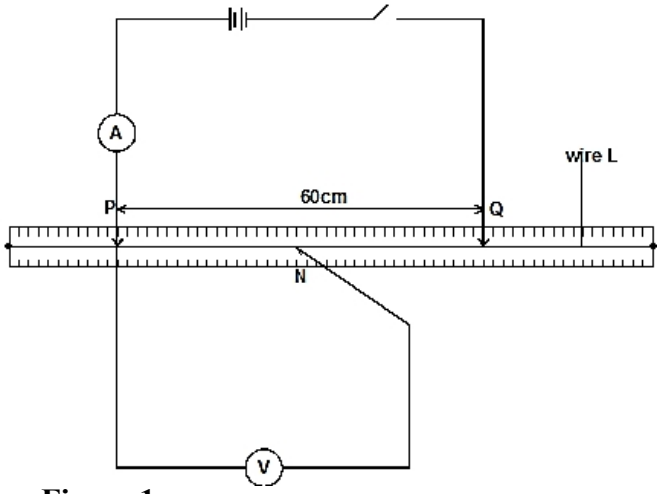

Figure 1

d) i) Close the switch and record the current. (1 mark)

I = ...A

ii) Measure and record in table 1 in the potential differences across PN.

iii) Measure and record the potential difference across PN for the other values of PN shown in table 1 and complete the table. *(The current is expected to remain constant)*

Hint: *The switch should be closed only when reading the voltmeter.*

Table 1

Length PN (m)	0.1	0.2	0.3	0.4	0.5	0.6
P.d (v)						
Resistance $^{V}/_{I}(\Omega)$						

(6 marks)

e) On the grid provided, plot a graph of resistance (y -axis) against length. (3 marks

f) From the graph, determine;
i) the slope **S** and its units. (3 marks)

ii) the constant **k** and its units given that; $S = \frac{4k}{pd^2}$ (3 marks)

g) Determine constant t given that; $t = \frac{E_0}{V_n}$, where V_n is the p.d at PN = 0.6m. (2 marks)

I

QUESTION 2

You are provided with the following;

- A meter rule
- A spring balance
- A weight of 2N with a hook or (2- 100g masses)
- A stand
- Knife edge support
- Two light strings about 10cm long

Proceed as follows;

a) Using the string provided make two loops to be used as hooks L1 and L2 in the diagram 2.
b) Suspend the spring balance from a clamp and using one loop to support the rule from the spring so that the loop L2 is on 85cm mark.
c) Support the other end of the rule with a knife edge at the 10cm mark so that the rule is horizontal.
d) Using loop 1 suspend the 2N weight at a distance d = 10cm from the knife edge as shown and take the readings of the spring balance, F. Record the results in the table.
e) Adjust the distance d to 20, 30cm etc and each time recording the readings of the balance to complete the table. (6 marks)

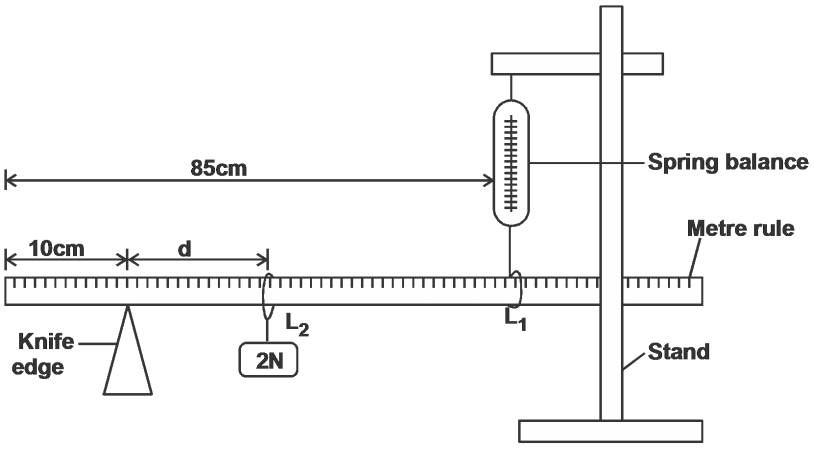

Diagram 2

Results

a

Distance (d)	10	20	30	40	50	60	70
Force (N)							

i) Plot graph of force F against distance d(cm). (5 marks)

ii) From your graph determine;

i) the slope (3 marks)

ii) the value of F when d = 0 (2 marks)

iii) Using the information from your graph, determine the constant k and m in the equation below and state units. F represents the reading of the balance and d is as shown in the above. F = 2md + 40k (4 marks)

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