Name: ………………………………………………………..……… Index No: …………………….

Candidate's signature…………………………

Date……………………………………………

Muungano KCSE Trial Exam

232/3

***PHYSICS** (PRACTICAL)*

PAPER 3

July 2017

2½ Hours

INSTRUCTIONS:

Write your name and index number in the spaces provided above.
Answer all the questions in the spaces provided in the question paper.
You are supposed to spend the first ***15 minutes*** of the ***2½ hours*** allowed for this paper reading the whole paper carefully before commencing your work.
Marks are given for a clear record of the observations actually made their suitability accuracy and the use made of them.
Candidates are advised to record their observations as soon as they are made.
KNEC mathematical tables and non programmable silent calculators may be used.

Q1

	a (i)	*(ii)*	*(iii)*	*b*	*C (v)*	*d*	*e(i)*	*(ii)*	***Total***
Maximum score	1	1	1	2	6	5	2	2	20
Candidates Score									

Q2

	b	*d*	*e*	*f*	*g (i)*	*(ii)*	*h(i)*	*(ii)*	***Total***
Maximum score	1	4	5	2	2	2	2	2	20
Candidates Score									

Grand Total	

This paper consists of 6 printed Pages

Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing

QUESTION 1

PART A

You are provided with the following:

- A clamp, boss and stand, A spiral spring with pointer, A micrometer screw gauge, A vernier caliper, A metre rule, Two wooden blocks, A stop watch, two 50g masses and two 100g masses.

Proceed as follows:

(a) (i) ***Determine*** the number of turns ,N, of the spiral spring

N = ………………………….. (1mk)

(ii) Use the vernier caliper to determine the outer diameter, ***D***, of the spiral spring

D = …………….. cm, ***D*** = …………………… m (1mk)

(iii) Use the micrometer screw gauge to determine, d, the diameter of the wire making the spring.

d = …………….. mm, ***d*** = …………………… m (1mk)

(b) ***Determine*** the value of, H, given that : $H = \frac{\pi D^2 d}{2} N$ (2mks)

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(c) (i) Set up the apparatus as shown in the diagram

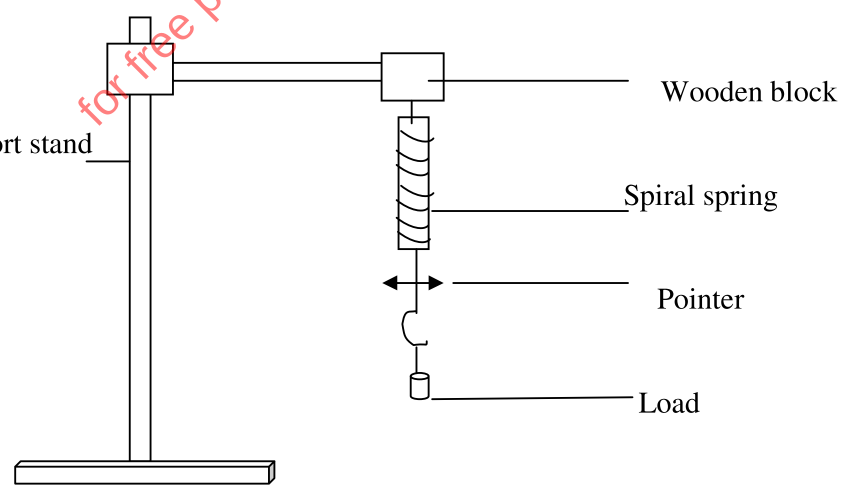

Figure 1

(ii) ***Suspend*** the 0.10kg mass on the lower hook of the spring and ***give*** the mass a <u>small</u> vertical displacement so that it oscillates up and down.

Turn Over

(iii) Use the stop watch to ***measure***, the time, ***t***, taken to complete 10 oscillations hence ***record*** the periodic time ,***T***, and frequency ***F=1/T*** for the oscillation.

(iv) ***Repeat*** the above procedure for 0.15kg, 0.20kg, 0.25kg and 0.30kg.

(v) Tabulate your results in table below hence complete the table. (6mks)

Table 1

Mass, M (kg)	1/M (kg^{-1})	Time, t (s)	Periodic time, T(s)	F = 1/T (Hz)	F^2 (Hz^2)
0.10					
0.15					
0.20					
0.25					
0.30					

d) ***Plot*** a graph of 1/M against F^2 (5mks)

e) (i) ***Determine***, ***S***, the slope of the graph (2mks)

…………………………………………………………………………………………………

…………………………………………………………………………………………………

(ii) Given that $1/M = 4\pi^2 F^2/K$, ***determine*** the value of ***k***. (2mks)

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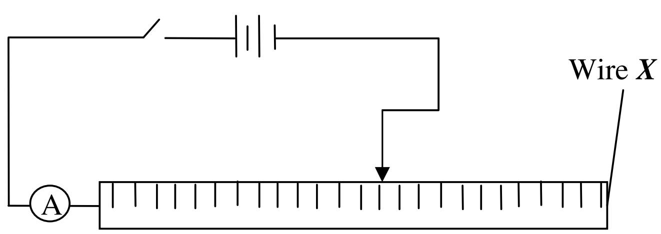
<u>Question 2</u>
You are provided with the following

- new dry cells size D
- A cell holder
- A switch
- An ammeter
- A voltmeter
- 6 connecting wires at least three with crocodile clips
- Nichrome wire mounted on the metre rule labeld ***X***
- A micrometer screw gauge (to be shared)

Proceed as follows

a. Connect the circuit as shown in the figure below.



b. Measure the voltage, E of the dry cell before closing the switch

E=…………………… V (1mk)

c. Adjust the length L of the wire 0.2m, close the switch S and read the value of current and record in the table below.

Table 2

Length L(m)	0.2	0.3	0.4	0.5	0.6	0.7
Current , I(A)						
$\frac{1}{I}$ **(A^{-1})**						

d. Repeat the procedure in (c) above for the value of lengths given in the table (4mks)

Calculate the values of $\frac{1}{I}$ and record in the **table 2** above.

e. On the grid provided ***plot*** a graph of $\frac{1}{I}$ (y axis) against L (5mks)

f. ***Determine*** the gradient of a graph (2mks)

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……………………………………………………………………………………………………

g. (i) ***Measure*** the diameter ***d*** of the wire in three points used and ***find*** the average diameter.

d_1=……………………………d_2 =……………………… d_3……………… mm (1mk)

Average d=……………………………m (1mk)

(ii) ***Determin***e the cross section area, A of the wire (2mks)

……………………………………………………………………………………………………

……………………………………………………………………………………………………

h. From the equation

$\frac{1}{I} = \frac{kl}{AE} + \frac{Q}{E}$: ***determine***

i) The value of ***k*** (2mks)

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

ii) The value ***Q*** (2mks)

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