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

**Candidate’s Sign. …………............**

**232/3 Date…………………………………**

**PHYSICS**

**PAPER 3**

**JULY /AUGUST 2014**

**TIME: 2 ½ HOURS**

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

**232/3**

**Physics**

**Paper 3**

**2 ½ hrs**

**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.*
* *Marks are given for a clear record of the observation actually made, their suitability, accuracy and the use made of them.*

**For Examiners’ Use Only**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Question 1** | **c** | **f** | **g(i)** | **g(ii)**  | **g(iii)** | **h** |
| **Marks Score** | 2 | 7 | 5 | 2 | 2 | 2 |
| **Candidate’s score** |  |  |  |  |  |  |

 TOTAL

|  |  |  |
| --- | --- | --- |
|  | **Part I** | **Part II** |
| **Question 2** | **b** | **d** | **e** | **f** | **b** | **c** |
| **Marks Score** | 1 | 8 | 5 | 2 | 3 | 1 |
| **Candidate’s score** |  |  |  |  |  |  |

TOTAL

 GRAND TOTAL

*This paper consists of 4 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.*

1. You are provided with the following apparatus:-

 A metre rule

One stop watch, one stand, clamp and boss

One spring

Two pieces of wood

A beam balance or electronic balance (to be shared)

One mass labeled M

Proceed as follows

(a) Hang the spring vertically by clamping one end as shown in figure 1. (The small pieces of wood to clamp the spring)



(b) Measure the length Lo, of the unloaded spring, and record below

 Lo=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_mm ( ½ mk)

(c) Hang the mass M given from the lower end of the spring. Measure the lenth, L1 of the loaded spring

 L1=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_mm ( ½ mk)

(d) Find the value of L1-L0\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cm (1mk)

(e) Using the balance given, find the mass of the object M

Mass of M=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_g (1mk)

(f) Hang the mass M from the lower end of the spring. Displace it by small vertical distance and release so that the spring makes vertical oscillations.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Oscillations,N |  5 | 7 | 10 | 13 | 15 | 18 | 20 |
| Time in seconds, t(s) |  |  |  |  |  |  |  |
| (N+10t)(s) 10 |  |  |  |  |  |  |  |
| (N+10t)2(S)2 19 |  |  |  |  |  |  |  |

 Complete the table (7mks)

(g) On the grid provided, plot a graph of N+10 2 (y-axis) against N (5mks)

 10



 (h)(i) Determine the slope S, of the graph at N=16 (3mks)

 (ii) Find the constant k, given that:

 K= MS

 13L (2mks)

2. You are provided with the following apparatus:

 Concave mirror and holder

 Metre rule

 Candle 9about 7cm)

 White screen

1. (i) Determine the focal length of the mirror by focusing a distant object

*fo*=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1mk)

(ii) Arrange the apparatus as shown in figure 2 below



**Concave mirror**

**X**

*fo*

 (b) Plot a graph of x against  (5mks)



 (iii) Place the candle at a distance *fo*+L(say *fo*+2cm) from the mirror

 (iv) Starting with the screen at a distance of 100cm from the mirror, gently move it towards

 the mirror until a sharp inverted image is formed.

 (v) Measure and record the distance x.

 (vi) Repeat step (iii-v) for other values of L and record your results in table 2

 Complete the table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| L(cm) | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| X(cm) |  |  |  |  |  |  |  |  |
| (cm-1) |  |  |  |  |  |  |  |  |

 (4mks)

 (c) Find the slope S of the graph (3mks)

 (d) Given that determine f from your graph (3mks)

 **PART B**

 You are provided with the following apparatus

 A voltmeter (0-3 or 0-5V)

 An ammeter (0-1A)

 10Ω resistor (fixed)

 A switch

 One dry cell and cell holder

 Six connecting wires

 (a)(i) Connect the above apparatus as shown in the circuit diagram below with the switch **S** open



 (ii) With the switch S open record E the voltmeter reading

 E=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1mk)

 (iii) Close the switch and record V, the voltmeter reading and I, the ammeter reading

 V=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1mk)

 I=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1mk)

 (iv) Given that:

 E-V=Ir

 Find r for the dry cell (2mks)