**Name : …………………………………………………………… Index no ………........................**

**School : ……………………………………………………………. Candidate’s sign.......................**

**Date : …………………………………………………………….**



[**TEACHER.CO.KE SERIES 24**](https://teacher.co.ke/notes/)

**232/3**

**PHYSICS**

**PAPER 3**

**PRACTICAL**

**JULY/AUGUST 2011**

**TIME: 2 ½ HOURS**

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

**Physics**

**Paper 3**

**Practical**

**INSTRUCTIONS TO CANDIDATES:**

* *Write* ***your name*** *and* ***index number*** *in the spaces provided above*
* ***Sign*** *and* ***write*** *the date of examination in the spaces provided*
* *All workings* ***must*** *be clearly shown.*
* *You are supposed to spend the first 15minutes 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 use made of them.*
* *Non-programmable silent electronic calculators and KNEC mathematical tables may be used except where stated otherwise.*

 **For Examiner’s Use Only:-**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Question 1** | **(a)** | **b(iii)** | **b (iv)** | **b (v)** | **b (vi)** | **b (vii)** | **Total**  |
| **Maximum Score**  | 2 | 8 | 5 | 2 | 2 | 1 | 20 |
| **Candidate’s Score** |  |  |  |  |  |  |  |
|  **TOTAL SCORE** |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Question 2** | **A (c)** | **A(d)** | **A(e)** | **A(f)** | **B(a)** | **B (b)** | **Total**  |
| **Maximum Score**  | 7 | 5 | 2 | 1 | 1 | 4 | 20 |
| **Candidate’s Score** |  |  |  |  |  |  |  |
|  **TOTAL SCORE** |  |

*This paper consists of 7 printed pages. Candidates should check the questions to ascertain that all the pages are printed as indicated and no questions are missing.*

 **Question 1**

1. You are provided with:

* String about 150cm
* Two small pieces of wood to clamp one end of string.
* A pendulum bob
* A Retort stand
* Clamp and boss
* A metre rule
* A stop watch
* Vernier calipers
* Micrometer screw gauge

 **Procedure**

 (a) Measure the diameter of the bob using;

 (i) Micrometer screw gauge

 Mean diameter = mm

 m (1mk)

 (ii) Vernier calipers

 Mean diameter = cm

 m (1mk)

 (b) Assemble the apparatus as shown below.

Insert diagram

 (i) Make the length of the pendulum l to be 144cm.

 (ii) Displace the pendulum bob through a small angle and release. When the oscillations are steady in the same plane, find the time taken for 20 oscillation of the pendulum. Repeat the experiment and then find the mean time taken for 20 oscillations. Calculate the period time, T, of the pendulum. Enter your results in the table below.

 (iii) Repeat the experiment for four other values of l in the table and complete the table.

|  |  |  |  |
| --- | --- | --- | --- |
| **Length l (m)** | **Time for 20 oscillations (s)** | **Period T (s)** | **√l (m) ½**  |
| t1 | t2 | Mean  |
| 1.44 |  |  |  |  |  |
| 1.21 |  |  |  |  |  |
| 1.00 |  |  |  |  |  |
| 0.64 |  |  |  |  |  |
| 0.49 |  |  |  |  |  |

 (iv) Plot a graph of period T against √l (5mks)



(v) Calculate the gradient, s, of the graph. (2mks)

 (vi) Given that a constant K can be obtained using the formula:

 S2=40

 K

 Calculate K. (2mks)

 (vii) State the units of K and its significance. (1mk)

2. ***You are provided with the following apparatus.***

* Resistor R
* Two dry cells (size D)
* Cell holder
* Torch bulb fixed in a bulb holder
* Voltmeter (V) (0-5V)
* Ammeter (A) (0-1A)
* Switch S
* Mounted wire (100cm)
* Seven connecting wires (4 with crocodile clips)

 ***Set up the circuit as shown in the figure below.***

Insert diagram

 **Proceed as follows:**

 (a) With crocodile clip at P (i.e L=100cm) take the voltmeter reading (V) and ammeter reading (I).

 Record the values of V and I in the table below.

 (b) Repeat procedure (a) for the length l=80, 60, 40, 20,0cm respectively.

 (c) Complete the table for corresponding values of V2 and R.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Length (cm) | 100 | 80 | 60 | 40 | 20 | 0 |
| Voltage V(v) |  |  |  |  |  |  |
| Current I (A) |  |  |  |  |  |  |
| V2 (v2) |  |  |  |  |  |  |
| R=V/I (Ω) |  |  |  |  |  |  |

(d) Plot a graph of V2 (Y-axis ) against R. (5mks)



(e) Determine the slope of the graph at the point R= 7Ω (2mks)

 (f) What physical quantity is represented by the slope of the graph at any given point. (1mk)

 (b) (a) Using colour coding in the table below. Find the resistance of the resistor R. (1mk)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Colour | Black | Brown | Red | Orange | Yellow | Green | Blue | Violet | Grey | white |

 R= Ω

 (b) Design a circuit and use it to calculate the V/I ratio for R. (4mks)