NAME: ……………………………………………………………..… ADM …………….

**JUJA GIRLS HIGH SCHOOL**

**END TERM II EXAMINATIONS 2018**

**FORM THREE**

***Kenya Certificate of Secondary Education (KCSE)***

***232/3***

***Paper 3***

***Physics (Practicals)***

***July /August 2018***

***2*** $\frac{1}{2}$***Hours***

**Instructions**

* *Answer* ***all*** *the questions in the spaces provided.*
* *You are supposed to spend the first 15 minutes of the* $2\frac{1}{2} $*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.*
* *Silent non- programmable electronic calculators and* ***KNEC*** *mathematical tables may be used.*

**For Examiner’s Use Only**

|  |  |  |
| --- | --- | --- |
| **Question** | **Maximum Score** | **Student’s Score** |
| 1 | 20 |  |
| 2.I | 9 |  |
| 2.II | 11 |  |
| **Total** | **40** |  |

**QUESTION 1**

 ***You are provided with the following:***

* A stand , bose and clamp
* Two wooden blocks
* A stop watch
* A half metre rule or metre rule
* A pendulum bob
* A cotton thread M
* A bare copper wire N

***Proceed as follows:***

1. Clamp the thread M between the wooden blocks so that the length, **Ɩ** of wire between the wooden blocks and the point of attachment of the bob is 5cm.

 Thread M

 Wooden blocks

 **Ɩ**

 Pendulum bob

1. Displace the pendulum bob slightly to execute simple harmonic oscillations. Record the time **t** for 10 oscillations and determine the period **T** in the table below.
2. Repeat part (b) for the other lengths of thread shown in the table below.
3. Complete the table. (6mks)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Ɩ (cm) | 5 | 10 | 15 | 20 | 25 | 30 |
| t (s) |  |  |  |  |  |  |
| T (s) |  |  |  |  |  |  |
| T2 (s2) |  |  |  |  |  |  |

1. Plot a graph of **Ɩ** (y- axis) against **T2**. (5mks)
2. Determine the gradient of the graph, **S.** (3mks)

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1. Now replace thread M with the bare copper wire N in the set up.
	* 1. For **Ɩ** = 20cm, displace the bob through a small angle in a horizontal plane and measure the time **tN** for 10 oscillations.

 **tN =** ……………………………………………………… (1mk)

* + 1. Determine the period **TN** = ………………………………………… (1mk)
		2. Calculate **TN2**  (1mk)

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* + 1. Determine the value of H given that $H= \frac{0.2}{T\_{N}^{2}}$ (1mk)

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* + 1. Calculate the value of $\frac{H}{S}$ (2mks)

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**QUESTION 2**

***PART A***

***You are provided with the following:***

* A rectangular glass block
* Four optical pins
* A piece of soft board
* A plain sheet of paper
* Sellotape
* Complete mathematical set

***Proceed as follows:***

1. Place the plain sheet of paper on the soft board and fix it using the sellotape provided. Place the glass block at the centre of the sheet and draw its outline. Remove the glass block.( see figure below)

 P1 P2

 θ

P3

 P4

 d

1. Draw a normal at a point 2cm from the end of one of the longer side of the block outline. This normal line will be used for the rest of the experiment. Draw a line at an angle θ=25o from the normal. Stick two pins P1 and P2 vertically on this line.
2. By viewing through the glass from the opposite side stick two other pins P3 and P4 vertically such that they are in line with the images of the first two pins. Draw a line through the marks made by P3 and P4 to touch the outline. Extend the line P1P2 through the outline. Measure and record in the table below the perpendicular distance **d** between the extended line and the line P3P4.(see figure above). Record this value in the table below.
3. Repeat procedure (b) and (c) for other values of θ in the table below. (2mks)

**NB**: *The sheet of paper with the drawing must be handed together with this question paper.*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| θ (deg) | 25 | 35 | 40 | 45 | 55 | 60 | 65 |
| D (cm) |  |  |  |  |  |  |  |

1. i) On the grid provided, plot a graph of **d** (y-axis) against **θ**. (5mks)

ii) Using the graph, estimate the value of d when θ=0o. (2mks)

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***PART B***

***You are provided with the following:***

* A metre rule
* Knife edge raised 20cm above the bench
* One 50g mass and 100g mass
* Some thread
* Some water in a beaker
* Liquid L in a beaker
* Tissue paper

***Proceed as follows:***

1. Balance the metre rule on the knife edge and record the reading at this point.

Balance point = …………………………………………cm (1mk)

For the rest of this experiment, the knife edge must be placed at the balance point.

1. Set up the apparatus as shown in the figure below. Use the thread provided to hang the masses such that the positions of support can be adjusted.

 X D 10cm

 Knife edge

 100g 50g Water

1. The balance is attained by adjusting the position of the 100g mass. Note that the distance X and D are measured from the knife edge and the 50g mass is fully submerged in the water. Record the values of X and D.

X = ……………………………………………….cm (1mk)

D = ……………………………………………….cm (1mk)

Apply the principle of moments to determine the weights W1 of the 50g mass in water and hence determine the upthrust UW in water.

W1 .......................................................................... N (2mks)

UW .......................................................................... N (1mk)

Remove the 50g mass from the water and dry it using tissue paper.

1. Now balance the metre rule when the 50g mass is fully submerged in the liquid L.

Record the value of the distance X.

X = ………………………………………………… cm (1mk)

Apply the principle of moments to determine the weight W2 of the 50g mass in the liquid L and hence determine the upthrust UL in the liquid.

W2 = …………………………………………………… N (1mk)

UL = …………………………………………………… N (1mk)

1. Determine the relative density R.D of the liquid given that: $R.D=\frac{U\_{L}}{U\_{W}}$( 2mks)

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End – All the best