**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Index No\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**School \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Candidate’s Signature \_\_\_\_\_\_\_\_\_\_\_**

**Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**232/3**

**Physics Practical**

**Paper 3**

**March/April, 2020**

**Time: 2**

**ARISE AND SHINE TRIAL 1 EXAM**

**MARCH/APRIL – 2020**

**INSTRUCTIONS TO CANDIDATES**

1. Write your **name** and **index number** in the spaces provided above
2. **Sign** and write the date of examination in the spaces provided above
3. Answer **ALL** the questions in the spaces provided in the question paper
4. 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.
5. Marks are given for **a clear record of the observations** actually made, their suitability, accuracy and the use made of them.
6. Candidates are advised to record their observations as soon as they are made.
7. **Non-programmable silent electronic calculators and KNEC** Mathematical tables may **be used.**
8. Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

**For Examiners’ Use Only**

**Question 1**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| QUESTION | i | ii | iii | vi | vii | viii | ix | TOTAL |
| MAXIMUM SCORE | 1 | 1 | 1 | 7 | 5 | 2 | 3 | 20 |
| CANDIDATE’S SCORE |  |  |  |  |  |  |  |  |

**Question 2**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| QUESTION | **Q2A** | | | **Q2B** | | | | **TOTAL** |
| MAXIMUM SCORE | c | d | e | b | c | d | e |
| CANDIDATE’S SCORE |  |  |  |  |  |  |  | 20 |
|  |  |  |  |  |  |  |  |  |

*This paper consists of 8 printed pages*

**QUESTION 1**

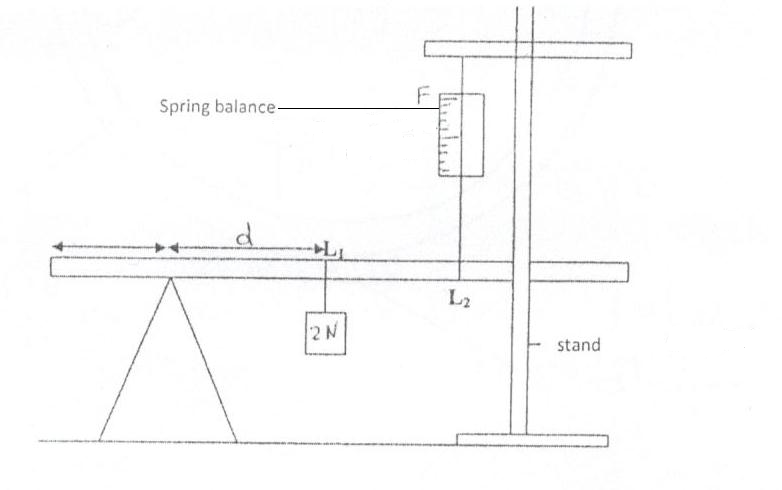
**PART A**

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

* A metre rule
* A spring balance
* A weight of 2N with a hook
* Stand
* Knife edge support
* Two light strings about 30cm long

**Proceed as follows;**

1. Using the strings provided make two loops to be used as hooks **L1** aNd **L2** in the diagram.
2. Suspend the spring balance from a clamp and using one of the loops support the rule from the spring so that the loop **L2**  is on the 95cm mark.
3. Support the other end of the rule with a knife edge at the 10cm mark so that the rule is horizontal.
4. Using loop **L1** 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.
5. Adjust the distance d to 20cm, 30cm etc. and each time recording the reading of the balance to complete the table. (4 marks)



|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Distance (d) (cm) | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
| Force (N) |  |  |  |  |  |  |  |  |

(f). (i). Plot a graph of force (F) against distance (d). (4 marks)



(ii). From the graph determine

(a). The slope (3 marks)

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

(b). The value of f when equation of the graph is 85f = 2md + 40k.

Determine the value of k and m. (2 marks)

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

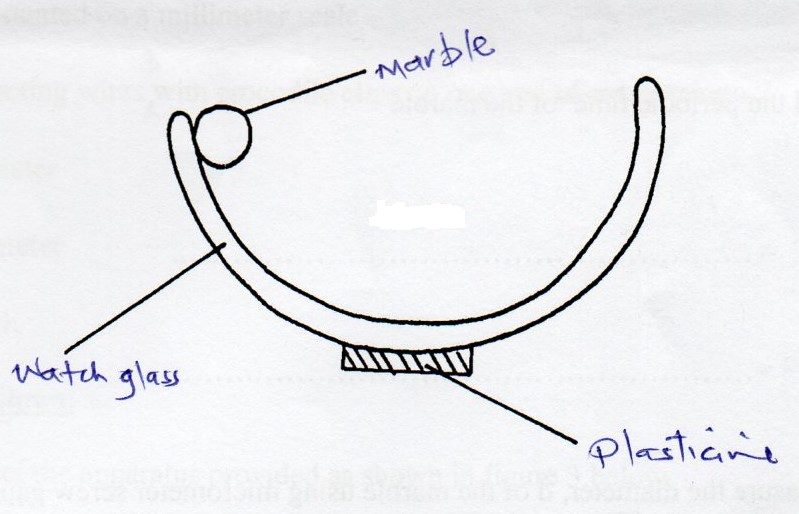
**Part B**

**You are provided with the following**

* Watch glass
* A class marble
* Plasticine
* Stop watch
* Micrometer screw gauge

(a). Place the watch glass on flat table and hold it firmly using plasticine.

(b). Roll the marble and count five oscillations.



(i). Time for five Oscillations

t = ………………………………………… (1 mark)

(ii). Repeat three times and find the average (1 mark)

t1 = …………………………………………………

t2 = …………………………………………………

t3 = …………………………………………………..

(iii). Find the periodic time of the marble. (1 mark)

T = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

T2 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(c). Measure the diameter, d of the marble using micrometer screw gauge

d = ……………………………………… (1 mark)

d). You are given the following equation

T = 2π

Where r is the radius of the marble, **g** is acceleration due to gravity, **b** is a constant of the system.

Determine the value of **b**. (2 marks)

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

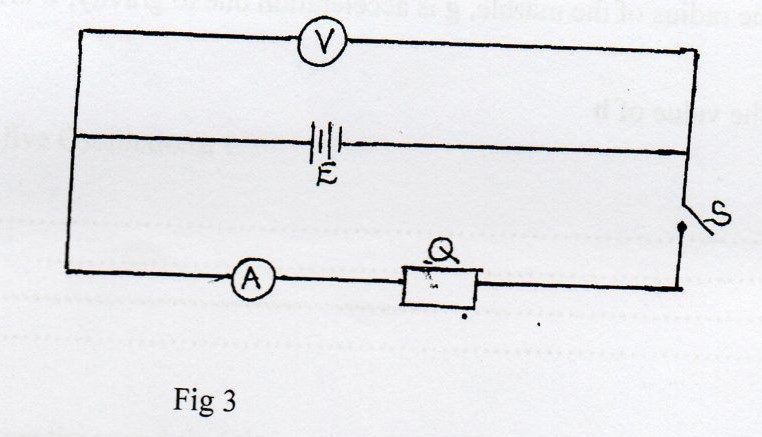
**QUESTION 2**

You are provided with the following apparatus

* Two new dry cells
* A resistor labeled Q
* Wire mounted on a millimeter scale
* 6 connecting wires 3 with crocodile clips on one end
* A voltmeter
* An ammeter
* A switch

**Proceed as follows:**

(a). Connect the apparatus provided as shown in figure 3 below.



(i). Take the voltmeter reading when the switch S is open.

V1 = ………………………………….volts (1 mark)

(ii). Close the switch S, and take the voltmeter reading V2 and the ammeter reading I

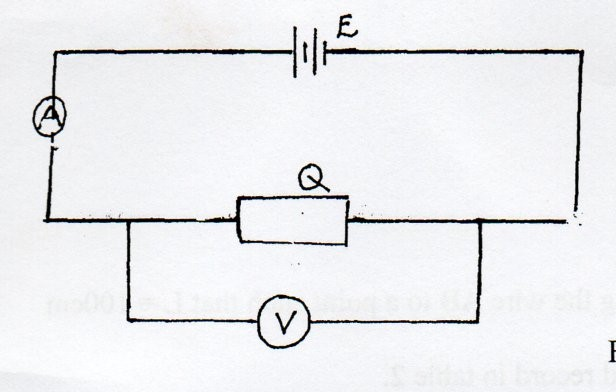
V2 = ………………………………volt (1 mark)

I = ……………………………….. Amperes (1 mark)

(iii). Calculate the quantity P = V1 – V2 (2 marks)

I

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………  
(b). Set up the circuit as shown in figure 4.



**Figure 4**

(i). Take the voltmeter reading V and the ammeter reading I. (2 marks)

V = ………………………………………….

I = ……………………………………………

(ii). Determine the resistance R of Q given that (1 mark)

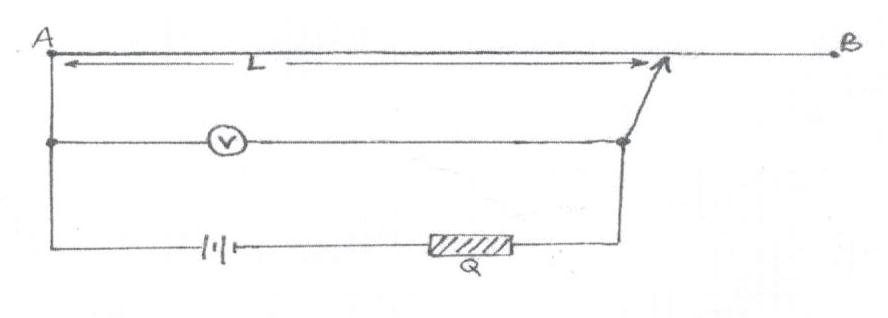
*R =V*

I

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

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

(c). Set up the circuit shown in figure 5.



(d). Move the crocodile clip along the wire AB to a point such that L = 100cm

Note the voltmeter reading and record in table 2.

(e). Repeat (d). above for values of L =80cm,60cm,40cm,20cm and 0cm, tabulate your results.

(5 marks)

Table 2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Length L (cm) | 100 | 80 | 60 | 40 | 20 | 0 |
| 1 1  L cm |  |  |  |  |  |  |
| **Voltmeter Reading**  **(V)** |  |  |  |  |  |  |
| 1/V  1/V |  |  |  |  |  |  |

(f). Plot the graph of 1/V against 1/L. (5 marks)



(g). Find the slope of the graph. (2 marks)

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