Name _____ **Index No**_____

School _____ **Candidate's Signature** _____

Date _____

232/3
Physics Practical
Paper 3
March/April, 2020
Time: 2 hours

ARISE AND SHINE TRIAL 1 EXAM

MARCH/APRIL – 2020

INSTRUCTIONS TO CANDIDATES

a) Write your **name** and **index number** in the spaces provided above
b) **Sign** and write the date of examination in the spaces provided above
c) Answer **ALL** the questions in the spaces provided in the question paper
d) 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.
e) Marks are given for **a clear record of the observations** actually made, their suitability, accuracy and the use made of them.
f) Candidates are advised to record their observations as soon as they are made.
g) **Non-programmable silent electronic calculators and KNEC** Mathematical tables may **be used.**
h) 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

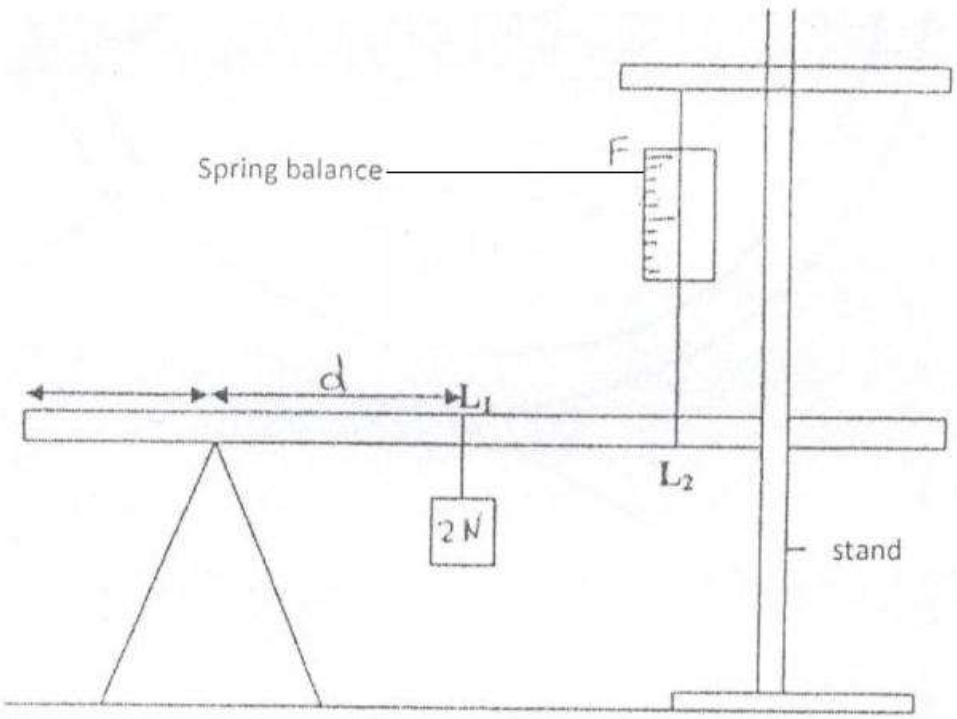
PART A

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

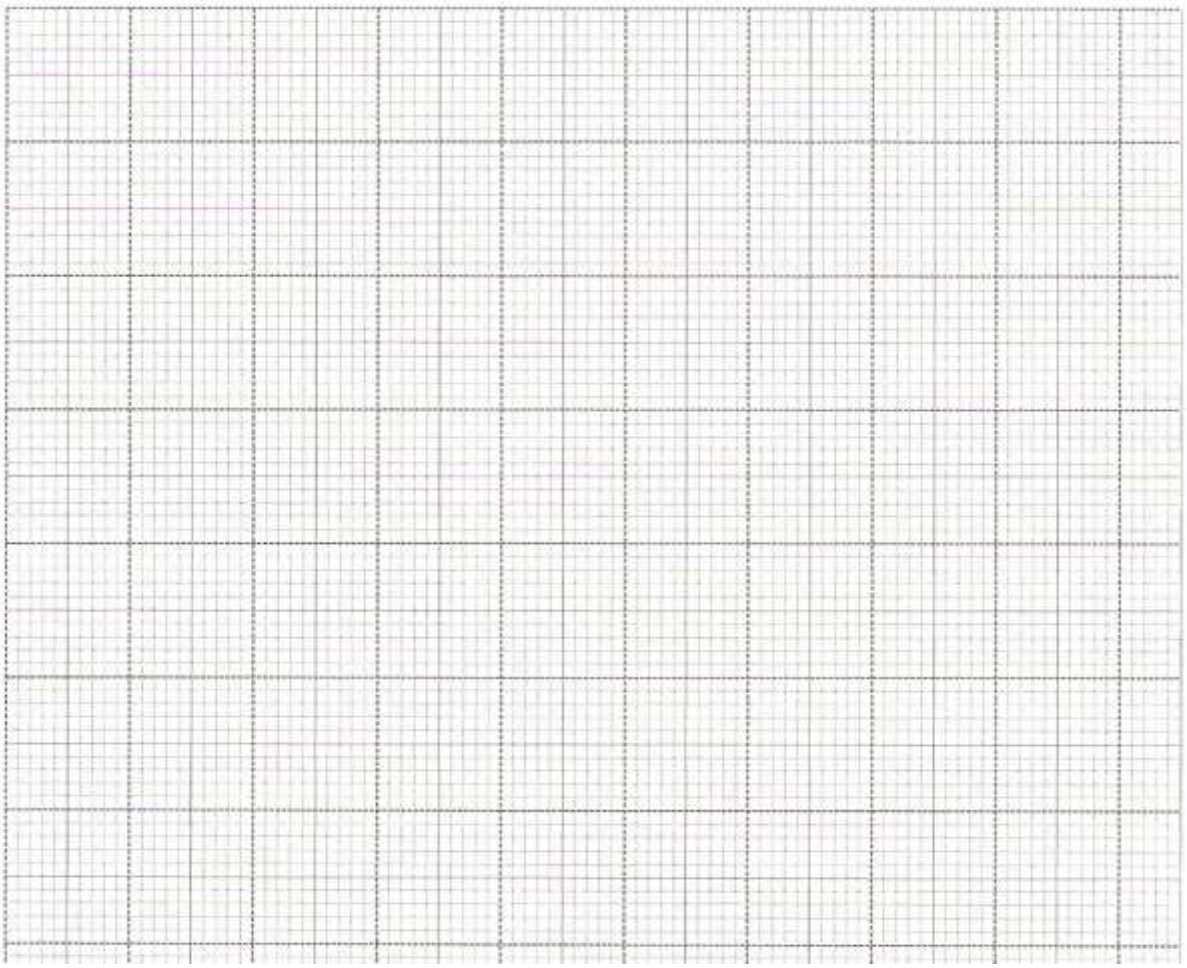
Proceed as follows;

a. Using the strings provided make two loops to be used as hooks $\mathbf{L_1}$ aNd $\mathbf{L_2}$ in the diagram.
b. Suspend the spring balance from a clamp and using one of the loops support the rule from the spring so that the loop $\mathbf{L_2}$ is on the 95cm mark.
c. Support the other end of the rule with a knife edge at the 10cm mark so that the rule is horizontal.
d. Using loop $\mathbf{L_1}$ 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.
e. 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)

……

……

……

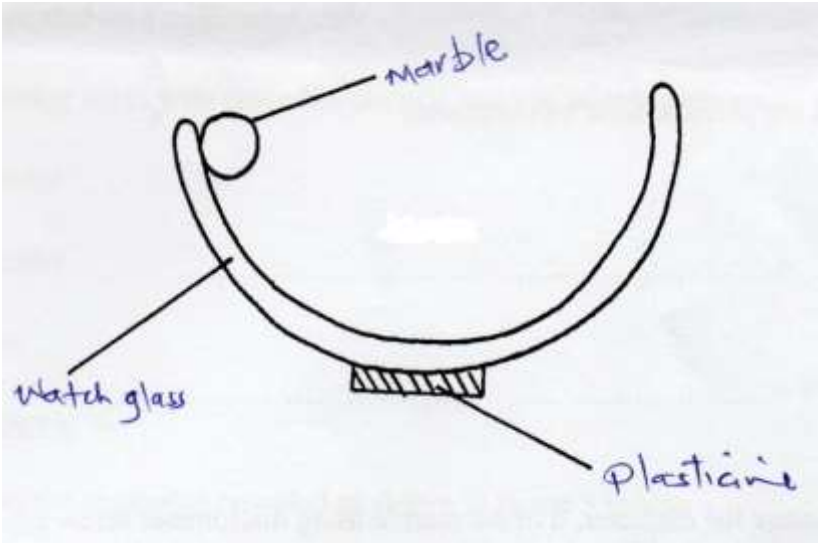
Part B

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)

t_1 = ……

t_2 = ……

t_3 = ……..

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

T = _____

T^2 = _____

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

d = …… (1 mark)

d). You are given the following equation

$$T = 2\pi\sqrt{\frac{7\,(b-r)}{5g}}$$

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.

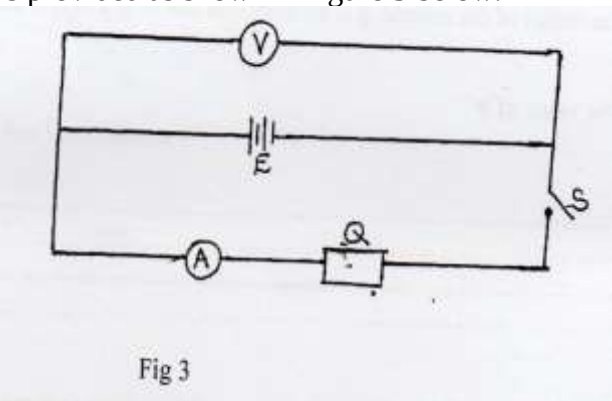


Fig 3

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

V_1 = ……volts (1 mark)

(ii). Close the switch S, and take the voltmeter reading V_2 and the ammeter reading I

V_2 = ……volt (1 mark)

I = …….. Amperes (1 mark)

(iii). Calculate the quantity $P = \frac{V_1 - V_2}{I}$ (2 marks)

……

……

……

……

……

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

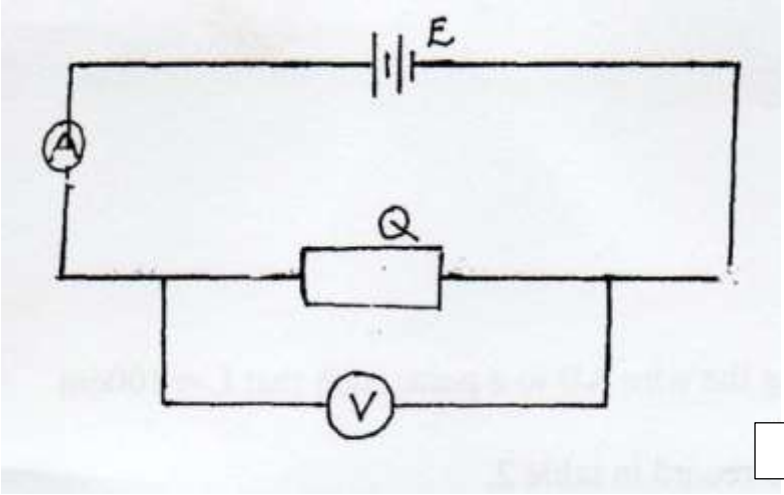


Figure 4

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

V = …….

I = ……

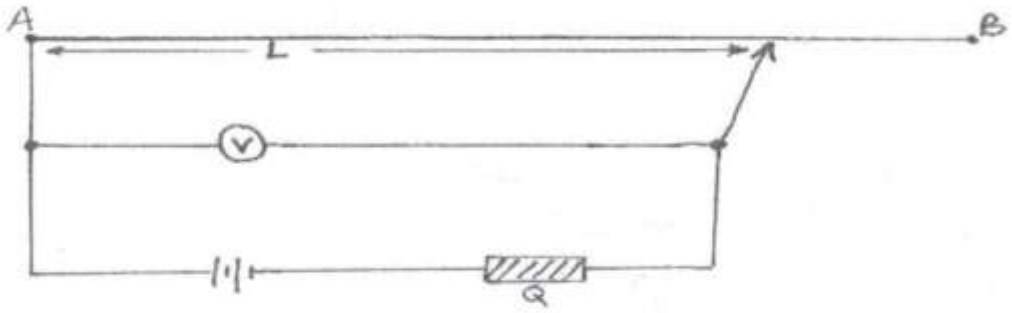
(ii). Determine the resistance R of Q given that (1 mark)

$R = \frac{V}{I}$

……

……

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



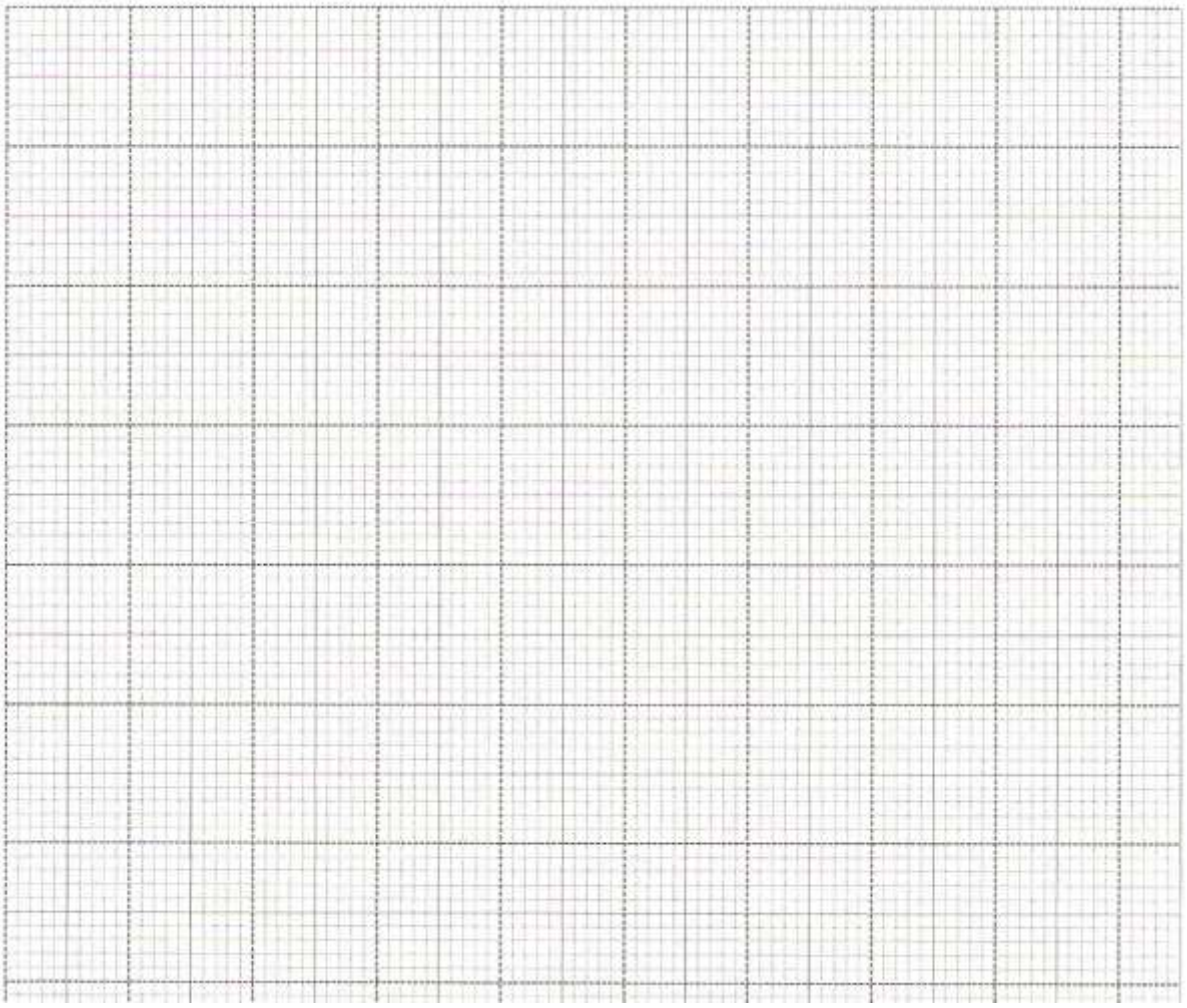
(d). Move the crocodile clip along the wire AB to a point such that L = 100cm
Note the voltmeter reading and record in table 2.

(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
$\frac{1}{L}\left[\frac{1}{cm}\right]$						
Voltmeter Reading (V)						
$^1/_V\left[^1/_V\right]$						

(f). Plot the graph of $^1/_V$ against $^1/_L$. (5 marks)



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

……

……

……

……