THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

031/2A

PHYSICS 2A
PRACTICAL A
(For Both School and Private Candidates)

Time: 2:30 Hours **Year: 2020**

Instructions

1. This paper consists of **two (2)** questions. Answer **all** the questions.
2. Marks for the questions are indicated at the end of each question.
3. Non-Programmable calculators may be used.
4. Cellular phones and any unauthorised materials are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

The following information may be useful:
Pie. π=3.14



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1. You are provided with a retort stand, a string of 110 cm, stopwatch, 50 g mass, cork pads and metre rule.

Proceed as follows:

(a) Set up the apparatus as shown in Figure 1.

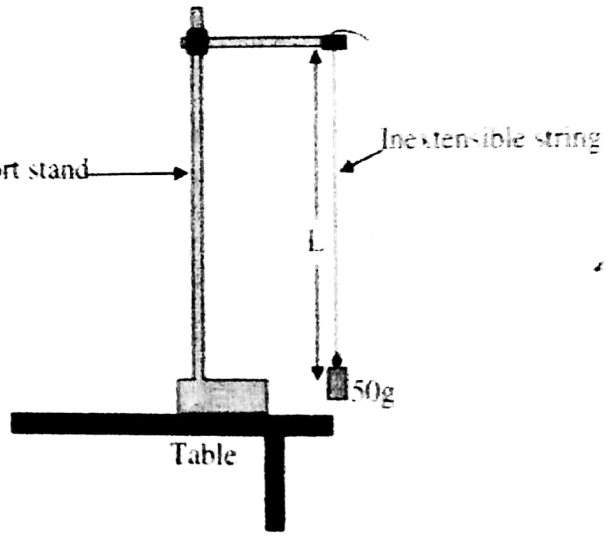


Figure 1

(b) Start with the length L = 10 cm, displace and release the 50 g mass to allow it oscillating. Determine the time t taken for the number of oscillations, n = 20.

(c) Repeat the procedures in 1 (b) for the values of L = 20 cm, 30 cm, 40 cm and 50 cm.

Questions

(i) Tabulate your results including the values of t^2.

(ii) Plot a graph of t^2 (sec^2) against the length L (cm).

(iii) Find the slope of the graph.

(iv) Determine the value of Z given that, $t^2 = \frac{4\pi^2 n^2 L}{Z} + c$.

(v) What is the significance of Z?

(vi) State the aim of this experiment.

(25 marks)

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2 You are provided with 2 dry cells connected in series, E, a resistance box R, a voltmeter V, and a key, K.

Proceed as follows:

(a) Arrange the apparatus as shown in Figure 2.

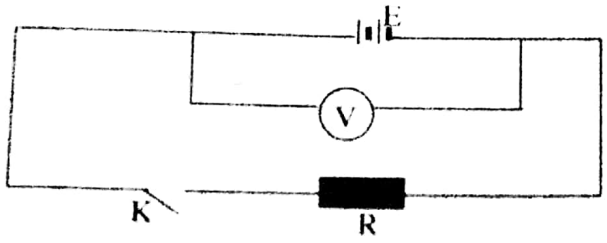


Figure 2

(b) Set R = 1 Ω in the resistance box, close the key, read and record the value of V on voltmeter.

(c) Repeat the procedure in 1 (b) for values of R = 2 Ω, 3 Ω, 4 Ω, and 5 Ω and record the values of corresponding V in each case.

Questions

(i) Tabulate your results including the values of $\frac{1}{V}$.

(ii) Plot a graph of $\frac{1}{V}$ against R.

(iii) Find the slope S of the graph.

(iv) Record $\frac{1}{V}$ intercept as P and R intercept as Q.

(v) Determine the value of the ratio $\frac{P}{Q}$, then state how the value obtained is related to the slope S of the graph.

(25 marks)

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