THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

031/2C **PHYSICS 2C**

(ACTUAL PRACTICAL C)

(For Both School and Private candidates)

Time: 2:30 Hours **Year: 2021**

Instructions

1. This paper consists of **two (2)** questions**.**
2. Answer **all** questions**.**
3. Each question carries twenty **five (25)** marks**.**
4. All writing must be in **blue** or **black** ink **except** drawing which must be in pencil.
5. Cellular phones, and any unauthorized materials are **not** allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet (s)



1. You are provided with: retort stand, stopwatch, a string of 100 cm, pendulum bob, cork pads and a metre rule.

(a) Set the length of the given string and its pendulum bob to have 50 cm from the point of suspension. The pendulum bob was to be just above the surface of the table to allow swinging of the bob for h = 1cm as shown in Figure 1.

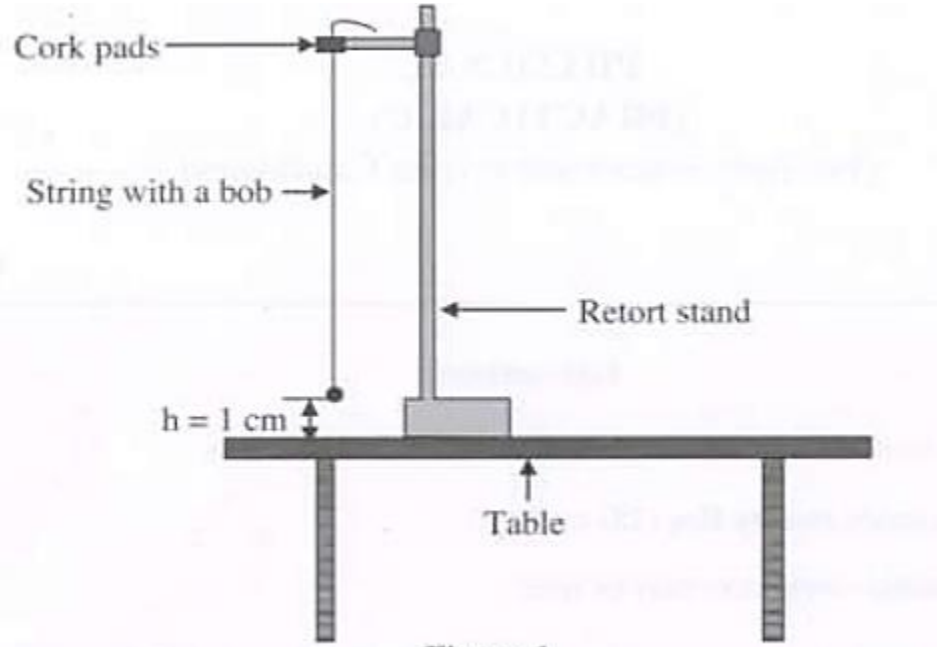


Figure 1

(b) Displace a bob in a small angle and then release it to initiate free oscillations. Using the stop watch provided, measure and record the time, t for 20 oscillations.

(c) Repeat the procedures in 1 (b) above using h = 10 cm, 20 cm, 30 cm and 40 cm. Record the corresponding time, t taken for 20 oscillations for each value of h; and then

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

(ii) Plot a graph of h against t^2

(iii) Determine the slope, S of the graph

(iv) Record the vertical intercept of the graph

(v) State the physical meaning of the answer obtained in 1 (iv)

(vi) Calculate the value of $P = -4\pi^2 n^2 S$

(vii) State the aim of the experiment.

2. You are provided with: a cell of e.m.f, E; a key, K; an ammeter, A; a voltmeter, V; connecting wires, a resistance box, R; a wire, W and a micrometer screw gauge.

(a) Set up an electric circuit as shown in figure 2 below

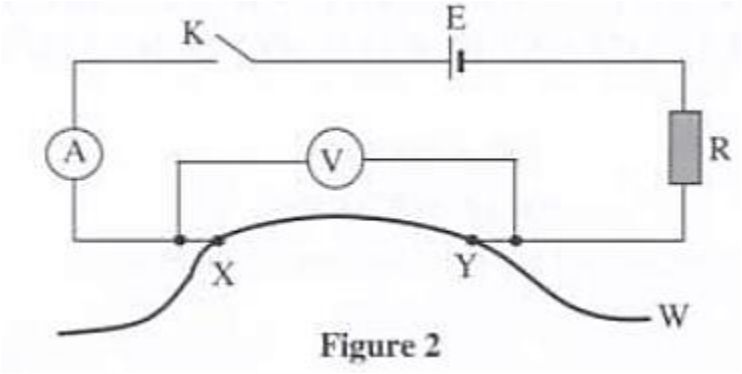


Figure 2

(b) Measure the length XY of the wire, W equal to 17 cm and set R to one 1 Ω then close the key. Read and record ammeter reading, I in Amperes and voltmeter reading, V in Volt. Open the key after taking the readings.

(c) Repeat the procedures in 1 (b) above for the values of R = 2 Ω, 3 Ω, 4 Ω and 5 Ω, keeping the length XY of the wire constant. Read and record the corresponding value of current, I and voltage, V in each case; and then

(i) Tabulate the results

(ii) Plot a graph of voltage, V against current, I

(iii) Compute the slope, S of the graph

(iv) State the physical meaning of the slope

(v) Use the information obtained from the graph to determine the resistivity of the material of wire, W