THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

031/2B **PHYSICS 2B**

(ACTUAL PRACTICAL B)

(For Both School and Private candidates)

Time: 2:30 Hours **Year: 2022**

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)



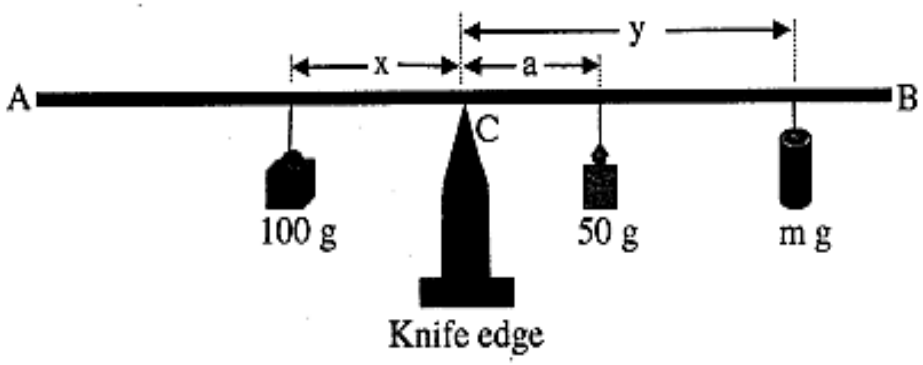
1. You are provided with unknown mass "m", a knife edge, 50 g mass, 100 g mass, and a metre rule. Perform experiment through the following procedures:

   (a) Find and mark the centre of gravity **C** of the metre rule **AB** by balancing it freely on a knife edge.

   (b) Place a metre rule on a knife edge at its centre of gravity **C**.

   (c) Suspend the 100 g mass at point x=10 cm from the centre of gravity of a metre rule. Suspend 50 g mass at distance a =5 cm from **C** on the other side of **C**.

   (d) Suspend the mass m to the side of 50 g mass and adjust it until the metre rule balances horizontally as shown in the following Figure.



   (e) Repeat the procedure in 1 (d) when x =15 cm, 25 cm and 30 cm. Find the corresponding value of y (cm) in each experiment. Answer the following questions:

      (i) Tabulate the results of x (cm) and y (cm).

      (ii) Plot a graph of x (cm) against y (cm).

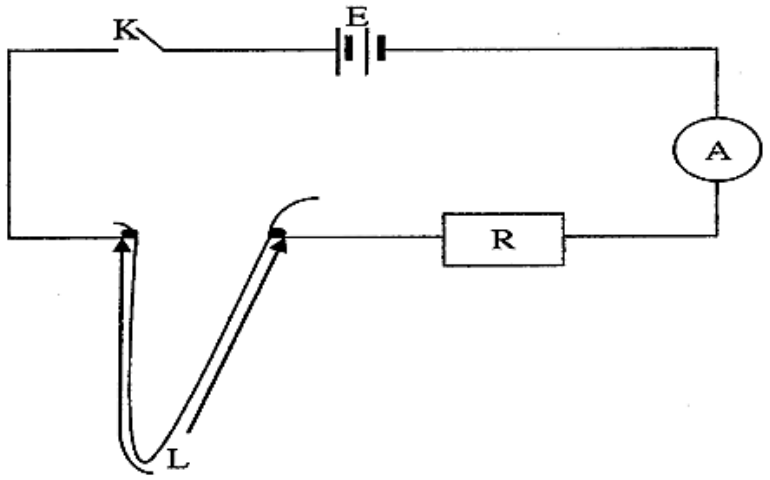
      (iii) Calculate the slope of the graph.

      (iv) Formulate the equation of the graph.

      (v) Determine the unknown mass m.

2. Determine the e.m.f of the cell and the resistance of a given piece of wire through the following procedures:

(a) Connect the circuit diagram as shown below in which E is a battery, K is a key, L is the length of the wire, R is the resistance box and A is an ammeter.



(b) With L = 12 cm and R set at 1Ω , record the ammeter reading I (A).

(c) Without altering the value of L, repeat the procedure in 2 (b) with R = 2 Ω, 3 Ω, 4 Ω and 5 Ω. Record the corresponding values of ammeter reading in each case.

(i) Tabulate the results of R, I and $\frac{1}{I}$.

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

(iii) Calculate the slope S of the graph.

(iv) Find the value of I for which R = 0. 91

(v) Determine the e.m.f and resistance of the wire L given that, the internal resistance of the cell was 1.0 Ω. Show clearly how to arrive to the answers.