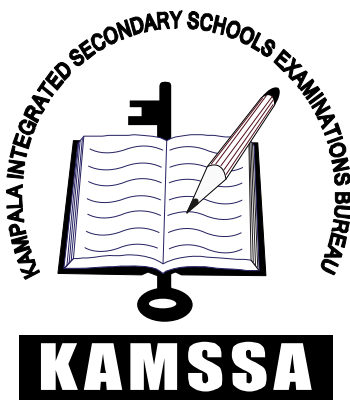




PRE-REGISTRATION EXAMINATIONS 2024

Uganda Certificate of Education

PHYSICS

Paper 2

Time: $1\frac{1}{4}$ hours

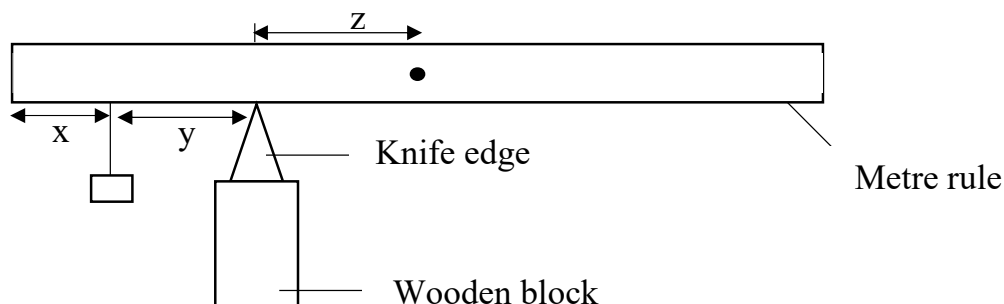
INSTRUCTIONS TO CANDIDATES:

- This paper consists of two examination items.
- Answer one item in all.
- Any additional items answered will not be scored.
- Candidates are not allowed to start working with the apparatus for the first quarter of an hour. This time is to enable candidates; read the items thoroughly, checking for the apparatus they will need and plan appropriately.
- A graph paper will be provided.
- Mathematical tables and silent non-programmable calculators may be used.

Item 1

In a certain institution, the principal tasked a new physics tutor to go to a carpenter in one of the nearby workshops and make metre rules. They were supposed to meet the specifications required by the Directorate of Industrial Training (DIT). When the metre rules were brought to the institution, the principle wanted to sample and verify that they had the correct masses, but she was busy in the meeting with DIT officials. She therefore asked a learner to help and do the verification.

Experimental setup



Task

As a physics learner, carry out a scientific investigation to determine the mass of metre rule.

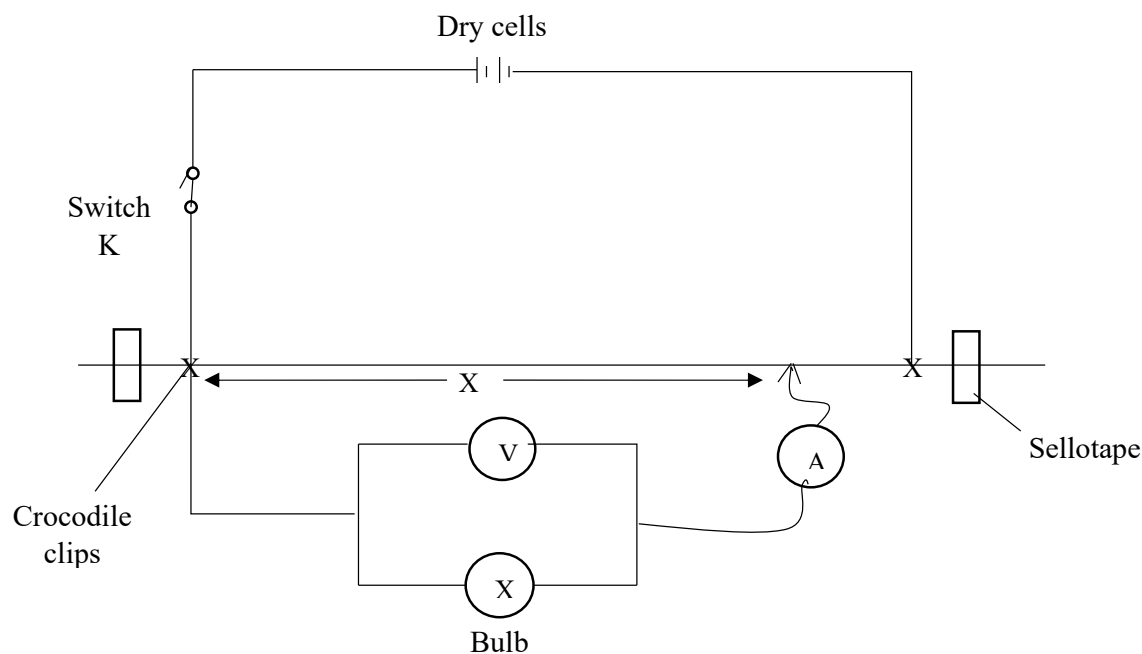
Hint

The principle of moment may be useful.

Item 2

A school was supplied with bulbs for laboratory use. When the laboratory technician tested the bulbs, he found out that they could light when connected to two dry cells but they produced dim light. He then tested some of the bulbs that had been supplied earlier and he discovered that they produced brighter light, even when connected to one dry cell each. He was surprised by the results and checked the newer bulbs supplied and he realized that they did not have specification on them. He also observed that their filaments were not of the same size as those of the older bulbs. This prompted him to doubt whether the filaments of the newer bulbs supplied had the recommended resistance. However, since he was very busy, the technician selected one of the bulbs and gave it to a learner to determine the resistance of its filament.

Set-up



Task

Assuming you are the learner who was selected by the laboratory technician, carry out a scientific investigation to determine the resistance of the bulb filament of the sample bulb.

Hint

$$r = \left(\frac{1}{I}\right)V$$