535/2
PHYSICS
Paper 2
2024
2 hours

MATIGO EXAMINATIONS BOARD

Uganda Certificate of Education

PHYSICS

Paper 2
Practical

2 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.*

Turn Over

Item 1

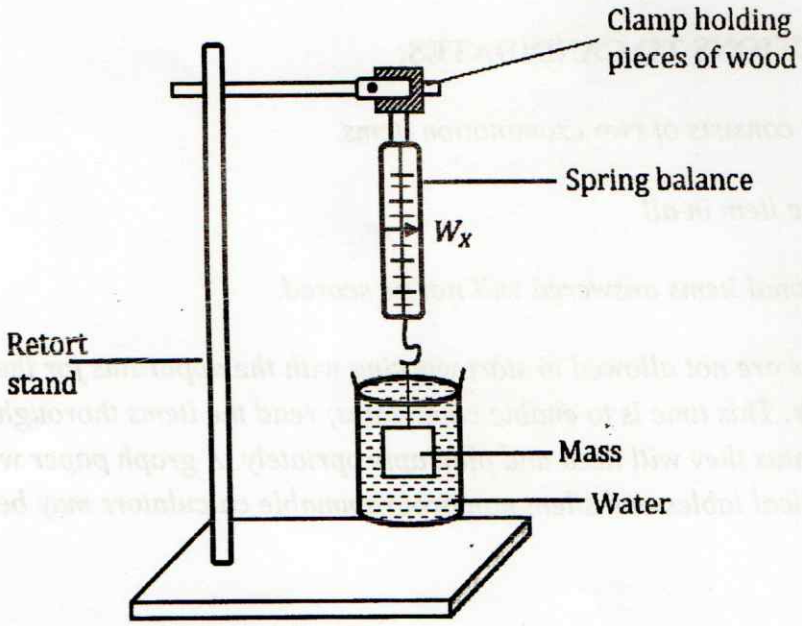
Uganda National Roads Authority (UNRA) is a body responsible for constructing roads in Uganda. It has contracted a certain company called STEEL & TUBE manufacturing company limited to make steel bars for the construction of the KARUMA Bridge with a specification of (5.0 to 10.0) grams for every cubic centimeter. The engineer in the company delivered the steel bars, unfortunately enough to find that the value of the specification given is not labelled on it.

You are provided with this type of steel bars in form of Masses.

Task:

As a student of physics, carryout a scientific investigation on the masses to help the contractor ascertain the exact specification of the steel bars using the masses given.

Guiding diagram:



Hint:

- Weight of the solid (Mass) in air, W_a , Weight of the solid (Mass) while immersed in water, W_x and β, the specification are related by the formula.

$$\frac{W_x}{W_a} = \left(1 - \frac{1}{\beta}\right)$$

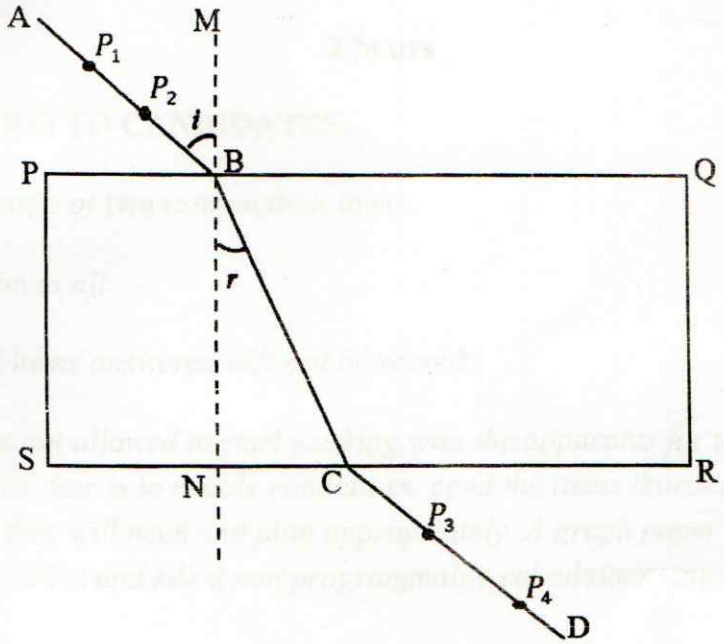
Item 2

During the S4 vacation, a student was working at a hardware shop that specialized in glass and its accessories. A customer approached the shop, seeking a specific type of glass that would glitter. However, the hardware owner was unsure how to determine the glittering property of the glass. The student, recalling their physics lessons, remembered that the glittering of materials like diamonds is due to their small critical angle. Nevertheless, the student couldn't quite recall how to determine the critical angle.

Task

Using scientific investigation, determine the critical angle of the glass material provided.

Hint:



For glass of refractive index, n the critical angle C is given by $nsinC = 1$

Any other set up may be used.

NB: HAND IN THE TRACING PAPER USED IN THIS EXPERIMENT.

END

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