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

031/2C

PHYSICS 2C
ACTUAL PRACTICAL C
(For Both School and Private Candidates)

Time: 2:30 Hours **Thursday, 20th November 2014 a.m.**

Instructions

1. This paper consists of **two (2)** questions. Answer **all** questions.
2. Where calculations are involved show your work clearly.
3. Marks for questions are indicated at the end of each question.
4. Calculators and cellular phones are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).
6. Use acceleration due to gravity, $g = 10ms^{-2}$.

1. The aim of this experiment is to determine the spring constant. Proceed as follows:

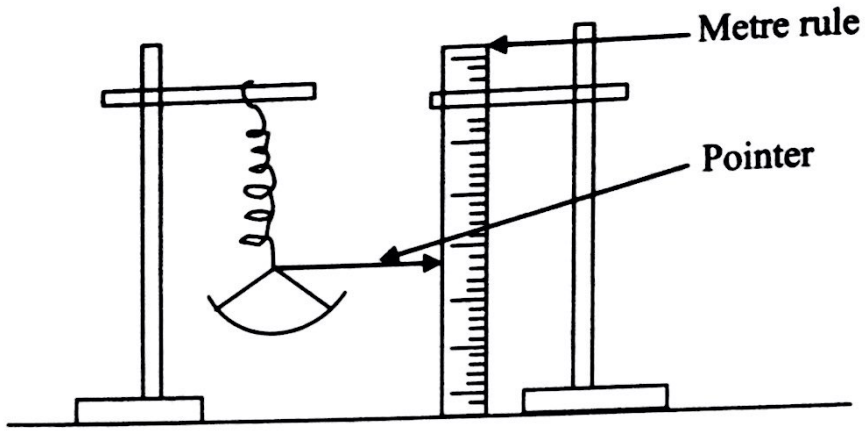


Figure 1

(a) Arrange the apparatus as shown in Figure 1.
Note that the zero mark of the metre rule has to be at the top.
(b) Read and record the position of the pointer shown from the metre rule when the pan empty, call it x_0.
(c) Put a 50g on the pan and read the new position of the pointer from the metre rule, c it x. Calculate the extension, $e = x - x_0$ corresponding to the mass added.
(d) Repeat the procedures in 1 (c) using mass of 100g, 150g, 200g and 250g.
(e) Tabulate your results.
(f) Plot a graph of extension e against mass m.
(g) What is the nature of the graph?
(h) Read and record the value of extension when mass = 237.5g.
(i) Determine the slope of the graph.
(j) Compute the value of spring constant, K.
(k) Name and state the law governing this experiment.
(l) State two possible sources of error in this experiment.
(m) How can you minimize the errors in (l)?

(25 mark

2. You are provided with drawing board, plane mirror with its holders, white sheet of pap drawing pins and optical pins. Proceed as follows:

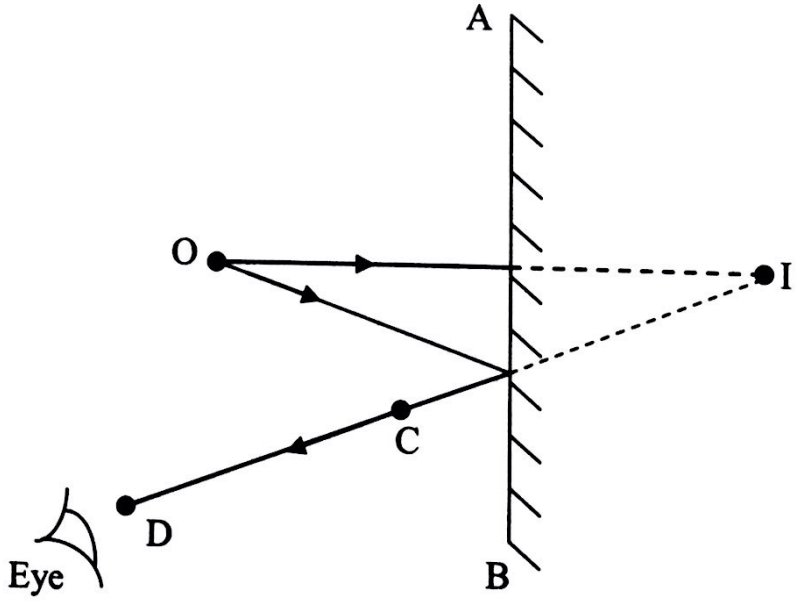


Figure 2

Place the drawing board on the horizontal bench. Fix the white sheet of paper on the drawing board using drawing pins. Draw a line AB and place the mirror on this line. Fix an Optical pin O at a point 5cm in front of the mirror. Locate the position of the image of pin O by using search pin I in such a way that there is no parallax between the pin and the image. Then measure its distance from the mirror. Repeat the procedure for the distances of 7cm, 9cm, 11cm and 13cm.

(a) Tabulate your results in a suitable table indicating the object distance u and image distance v.
(b) Plot a graph of v against u.
(c) State the nature of the graph.
(d) What is the nature of image?
(e) Determine the slope of your graph.
(f) What is the significance of the slope?
(g) Explain what will happen when a screen is placed in front of the mirror.
(h) State two uses of plane mirrors in commercial meters.
(i) State two sources of errors.
(j) Explain two precautions to be taken to avoid the errors in 2 (i).
(k) Suggest the suitable title of the experiment.

(25 marks)