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, 25th October 2012 a.m.**

Instructions

1. This paper consists of **two (2)** questions. Answer **all** the 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).

1. You are provided with a metre rule with a hole drilled at 50cm mark, steel knitting needle, unknown mass M of a dry cell size D, known mass W (100g) two weighing pans or two pieces of threads, retort stand and clamp. Proceed as follows:

(a) Locate and record the centre of gravity, C of the metre rule by balancing the ruler on the clamped knitting needle and ensure that the ruler balances in a horizontal position.

(b) Suspend unknown weight M at 10cm mark and adjust the position of W on the other side of O so that the ruler balances in a horizontal position.

(c) Measure the distances of M and W from O as x and y respectively.

(d) Draw the diagram for this experiment.

(e) Repeat procedures (b) and (c) above with M suspended from 15cm, 20cm, 25cm and 30cm marks.

(f) Tabulate your results.

(g) Plot a graph of y against x.

(h) State the nature of the graph.

(i) Read and record the value of y when x = 17.5cm.

(j) Calculate the slope G of the graph.

(k) Find the value of M given that the equation representing the graph is M = GW, where W is given.

(l) Mention and state the principle governing this experiment.

(m) State a possible source of error in this experiment.

(n) What is the aim of the experiment?

2. You are provided with Beaker, Retort stand and Clamp, two optical pins, liquid (water), small sheet of white paper, plasticine, a rectangular block of wood, a metre rule and 30cm transparent ruler. Proceed as follows:

(a) Put an optical pin O with a very small bob of plasticine to the bottom of a clean beaker and stand the beaker on a sheet of white paper as shown in Figure 1.

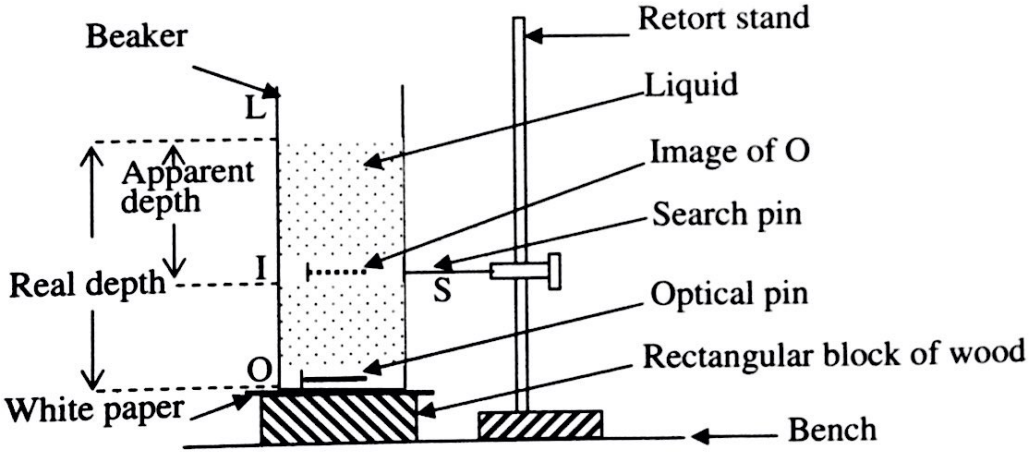

Figure 1

(b) Pour in a liquid carefully to about 11cm depth and view the optical pin O through this liquid. Adjust the position of the clamped search pin S so as to eliminate parallax between its point and that of the image I of O.

(c) Make ink marks on the beaker corresponding to the position of the surface and the position of image I.

(d) Taking care not to remove the ink marks, measure the real depth OL and the apparent depth IL of the pin.

(e) Remove ink marks and repeat for the depth of liquid of 9cm, 8cm, 6cm and 4cm.

(f) Tabulate your results.
(g) Plot a graph of OL against IL.
(h) Using graph, find the real depth when apparent depth is 3cm.
(i) Why an object O looks less deep when looking down into it?
(j) From the graph find its slope.
(k) What does the slope of the graph indicates?
(l) Find the reciprocal of the slope.
(m) Comment on the answer obtained in 2 (l).
(n) Identify three possible sources of error in this experiment.
(o) State ways to minimize the errors in 2 (n).
(p) Identify the principle governing this experiment.