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

1/2C

PHYSICS 2C
ALTERNATIVE C PRACTICAL
(For both School and Private Candidates)

me: 2:30 Hours **Friday, 22nd October 2010 a.m.**

Instructions

1. This paper consists of **three (3)** questions.
2. Answer **two (2)** questions including question **number 1.**
3. Whenever 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.
6. Write your **Examination number** on every page of your answer booklet(s).

Take $\pi = 3.14$

This paper consists of 4 printed pages.

1. The aim of the experiment in Figure 1 is to verify Hooke's Law using a spring. Proceed as follows.

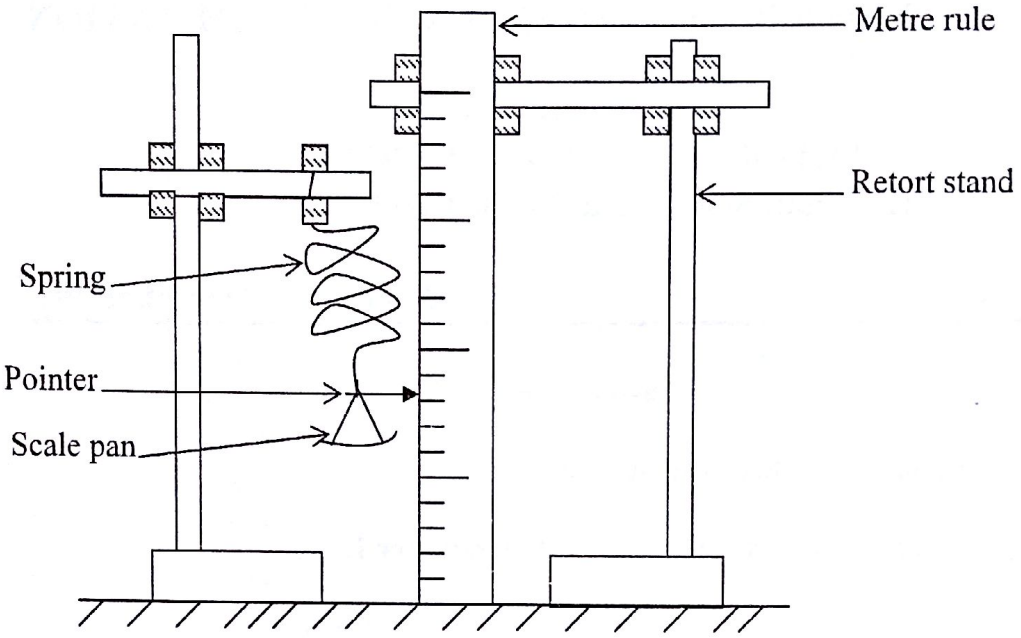


Figure 1

Set up the apparatus as shown in Figure 1. Record the length L_o indicated by the pointer w no mass on the scale pan. Place a 50g mass on the pan and record the new length L.

Repeat this procedure for M = 100g, 150g, 200g and 250 each time measuring t corresponding length L.

Tabulate your results as follows:
Initial length Lo = ...

Mass m (g)	Force F (N)	Length L (cm)	Extension e = L – Lo (cm)
20 40 60 80 100			

(i) Complete the table.
(ii) Plot a graph of force against extension e.
(iii) What are the values of the intercepts?
(iv) What is the nature of the graph? Explain the relationship between force and extensio
(v) Mention the sources of errors. **(25 marks)**

The aim of the experiment is to determine the critical angle A of a given glass block. Proceed as follows:

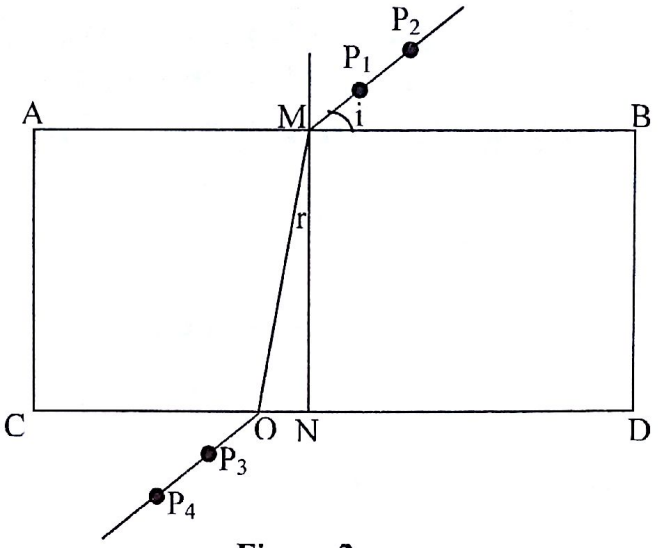


Figure 2

(a) Place the glass block on a white sheet of paper and trace its figure ABCD (Figure 2). Remove the block. Mark the centre M of face AB and draw a normal through M to a point N on the line CD.

(b) Draw lines to M at angles of 30°, 40°, 60°, 70° and 80° which acts as incident rays.

Erect two pins P_1 and P_2 on the 30° line. Return the block to its original position and stick pins P_3 and P_4 on the opposite side such that they appear to be in a straight line with P_1 and P_2 when viewed through side CD. Remove the glass block and trace the straight path taken by ray OP_3P_4. Using a ruler join O and M. Measure the angle of refraction r and calculate the values cos i and sin r.

(c) Repeat the procedure in (b) above for i = 40°, 50°, 60°, 70° and 80° each time measure the corresponding angle of refraction r.

(d) Tabulate your results for i, r, cos i and sir r.

(i) Plot a graph of sin r (vertical axis) against cos i (horizontal axis).
(ii) Determine the slope M of your graph.
(iii) Calculate the value of A when slope = sin A.
(iv) State the sources of errors. **(25 marks)**

3. You are required to determine the resistance P of a wire using the metre bridge. Proceed as follows.

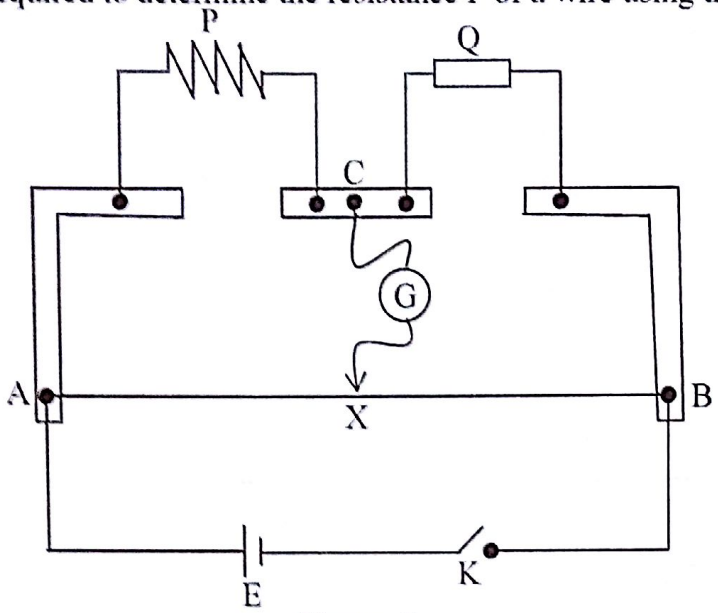


Figure 3

Connect the circuit as shown in Figure 3. Q is a standard resistor of resistance 2Ω. Close th switch k and find the balance point. Read and record lengths L_1 and L_2 of AX and XE respectively.

Open the switch and interchange the resistors P and Q. Repeat the above experiment.

Tabulate your values as shown below.

Before interchange Expt. 1	Resistance Q (Ω)	Length L_1 (cm)	Length L_2 (cm)	$\frac{L_1}{L_2}$	$R_1 = \frac{L_1}{L_2} Q\ (\Omega)$
After the interchange Expt. 2					$R_2 = \frac{L_1}{L_2} Q\ (\Omega)$

(i) Find the resistance R_1 of P.
(ii) Find the resistance R_2 of P.
(iii) Calculate the average value of resistances R_1 and R_2 of resistor P.
(iv) What is the resistance of P? **(25 marks)**