

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

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

041 2C

Time: 2:30 Hours

Thursday, 19th November 2015 a.m.

Instructions

1. This paper consists of **two (2)** questions. Answer **all** the questions.
2. Calculations should be clearly shown.
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, $g = 10\text{ms}^{-2}$.

1. You are provided with spiral spring, 2 retort stands, meter rule, 6 slotted masses of 50g, optical pin /pointer and plasticine/masking tape.

Proceed as follows:

- (a) Clamp the meter rule vertically with the zero mark on top as shown in Figure 1.

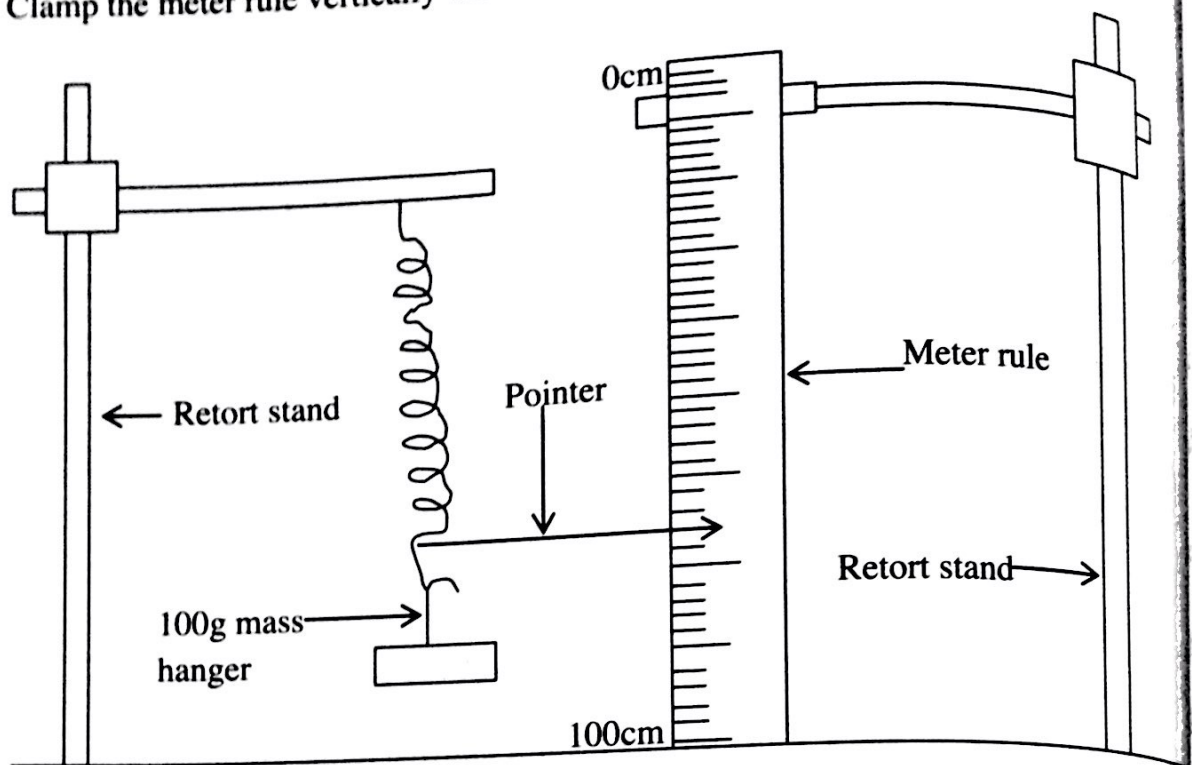


Figure 1

- (b) Suspend the spring on the clamp and attach an optical pin (pointer) to its lower end with the aid of plasticine/masking tape.
- (c) Record the initial reading (y_0) of the pointer at the meter rule.
- (d) Attach a 100g weight at the lower end of the spring, then record the new reading of the pointer, y .
- (e) Repeat part (d) above by adding 50g weight at a time until the total weight of the suspended weight is 300g.
- (f) Tabulate your results including a column of Load (in Newtons).
- (g) Plot the graph of extension against load.
- (h) What is the nature of the graph?
- (i) Determine the slope of the graph.
- (j) From the graph, calculate the spring constant.
- (k) What is the aim of this experiment?
- (l) Give one limitation of the experiment.
- (m) State the law governing this experiment.
- (n) State one source of error and one precaution to be taken when performing this experiment.

(25 marks)

2. The aim of this experiment in Figure 2 is to determine the E.M.F (E) and the internal resistance (r) of the dry cell.

- (a) Stretch and fix the bare wire onto the meter rule with cello tape.

- (b) Connect the dry cell, 2Ω resistor and the voltmeter as shown in Figure 2.

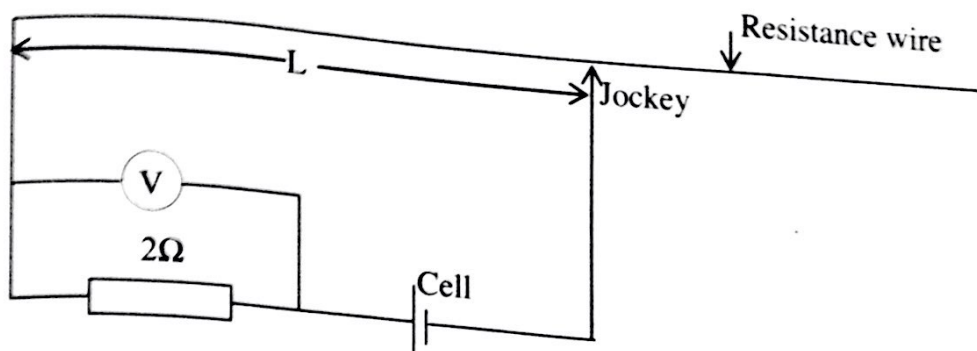


Figure 2

- Place the jockey on the bare wire such that L is equal to 20cm. Record the voltmeter reading V .
- Repeat procedure (c) above for values of L equal to 30cm, 40cm, 50cm and 60cm respectively.
- Record the values of L , V and $\frac{1}{V}$ in a suitable table.
- Plot a graph of $\frac{1}{V}$ against L .
- Find the slope, s , of the graph.
- Find n which is the value of $\frac{1}{V}$ when $L = 0$.
- Calculate the E.M.F of the dry cell from $E_s = 0.015(\text{cm}^{-1})$.
- Using the relation $r = 2(\Omega) \times n \times (E-1)$, calculate the internal resistance r of the dry cell.
- State three sources of errors and three precautions to be taken in this experiment.

(25 marks)