

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, 19<sup>th</sup> 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.

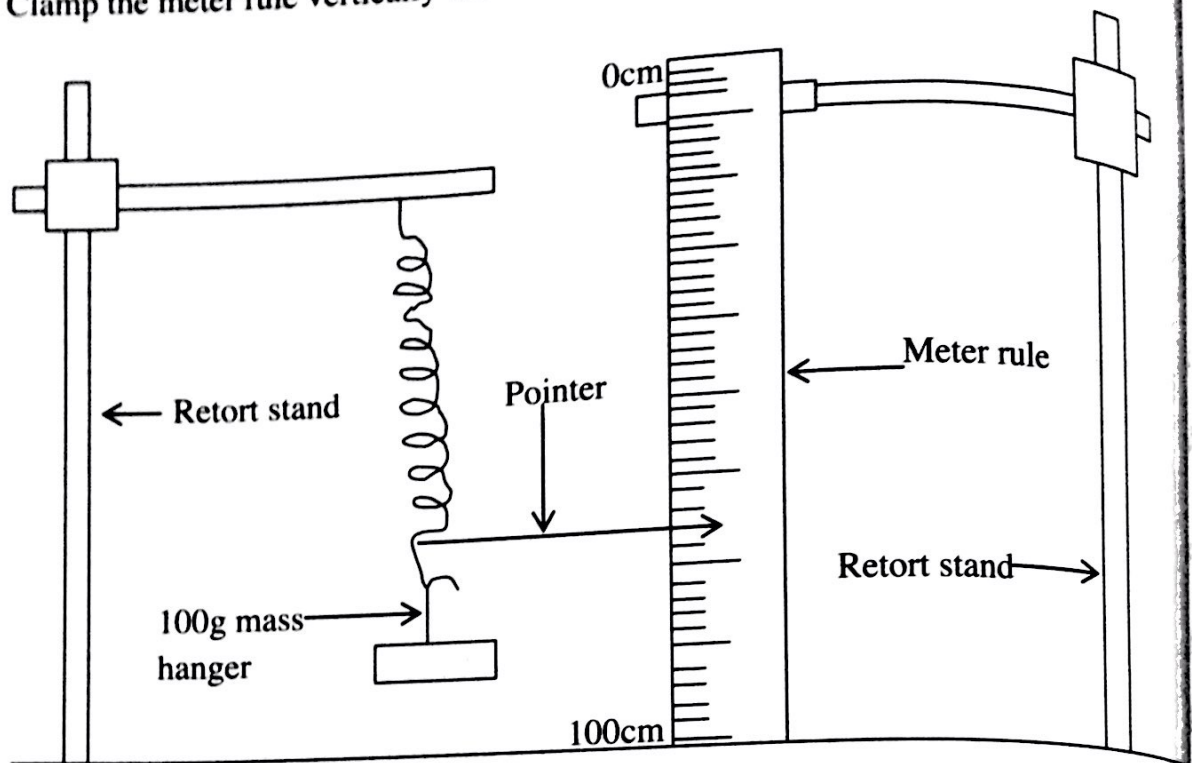


Figure 1

- Suspend the spring on the clamp and attach an optical pin (pointer) to its lower end with the aid of plasticine/masking tape.
- Record the initial reading ( $y_0$ ) of the pointer at the meter rule.
- Attach a 100g weight at the lower end of the spring, then record the new reading of the pointer,  $y$ .
- Repeat part (d) above by adding 50g weight at a time until the total weight of the suspended weight is 300g.
- Tabulate your results including a column of Load (in Newtons).
- Plot the graph of extension against load.
- What is the nature of the graph?
- Determine the slope of the graph.
- From the graph, calculate the spring constant.
- What is the aim of this experiment?
- Give one limitation of the experiment.
- State the law governing this experiment.
- State one source of error and one precaution to be taken when performing the 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,  $2\Omega$  resistor and the voltmeter as shown in Figure 2.

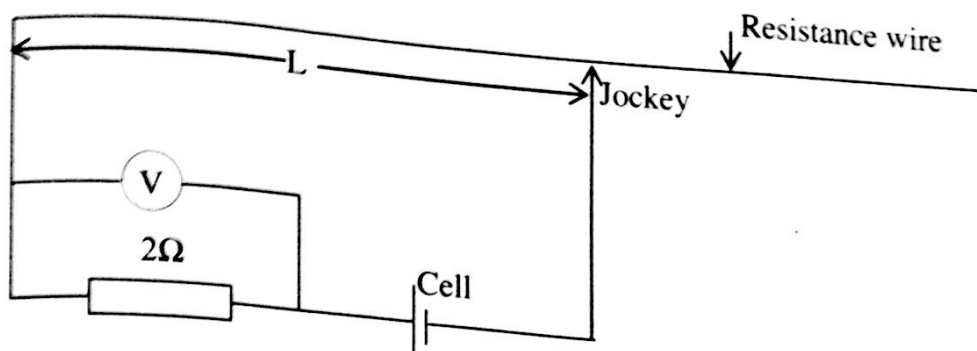


Figure 2

- 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)