

**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

Friday, 21st October 2011 a.m.

Instructions

1. This paper consists of **two (2)** questions. Answer **all** the questions.
2. 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.
5. Write your **Examination Number** on every page of your answer booklet(s).
6. Use $\pi = 3.14$.

1. The aim of this experiment is to determine the relationship between tension and extension using a spiral spring. Proceed as follows:

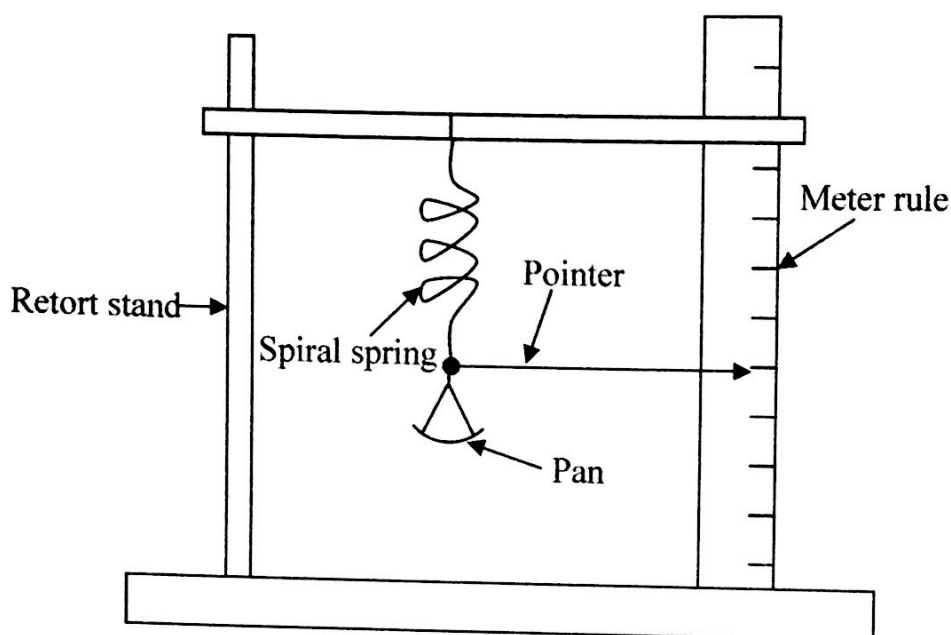


Figure 1

- Arrange the apparatus as shown in Figure 1.
- Read and record the position of the pointer shown from the metre rule when the pan is empty, call it T_0 .
- Put a 26g weight on the pan and read the new length from the metre rule, call it T . Find the extension $e = T - T_0$.
- Repeat the procedure in (c) above using weights of 52g, 78g, 104g, and 130g.

Table of results

Mass on pan (g)	26	52	78	104	130
Pointer reading (cm)					
Extension $e = T - T_0$					

- Complete the table of results.
- Plot a graph of mass against extension.
- Determine the slope of your graph.
- What is the physical significance of the slope obtained in (g) above?
- From the graph, determine the extension when the mass is 65g.
- Write the equation governing this experiment.
- Does the spring obey Hook's law? Give reason for your answer.
- State the law in (k) above.
- What will happen when the load greater than elastic limit is added on the scale pan?
- State a source of error in this experiment and show how it can be minimized.

(25 marks)

2. You are provided with a Battery, E, Rheostat, Rh, Switch, S, Ammeter, A, Voltmeter, V and Resistor, R. Proceed as follows:

- (a) Connect the Battery, Rheostat, Switch, Ammeter and Resistor in series as shown in Figure 2. The Voltmeter must be connected across R.

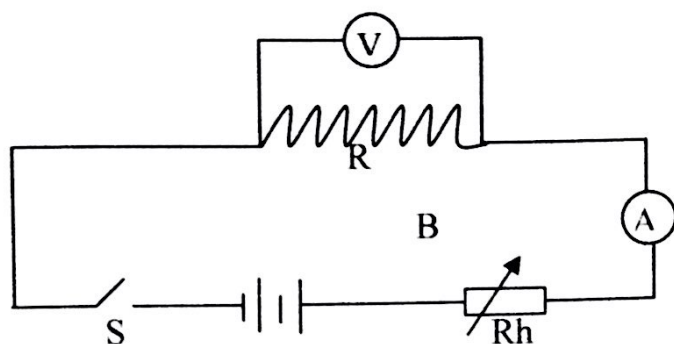


Figure 2

- (b) Switch on the current and adjust the Rheostat to obtain six (6) different values of Voltmeter readings (V) and corresponding values of Ammeter reading (A).
Note: To improve the accuracy, adjust the rheostat each time so that the voltmeter pointer (or ammeter pointer) is exactly on a division of the meter scale before taking your readings.
- (c) Tabulate your results including the value of $\frac{V}{I}$.
- (d) Deduce the aim of the experiment.
- (e) Draw a graph of Voltage (V) against current I.
- (f) Determine the slope of your graph.
- (g) Calculate the average value of R.
- (h) Comment on the values obtained in (f) and (g).
- (i) State the law governing this experiment.
- (j) Give a limitation of the law stated in (i).

(25 marks)