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

031/2A

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

Time: 2:30 Hours **Wednesday, 11th 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. The following information may be useful:

   $\pi = 3.14$

1. Assemble the apparatus as shown in the Figure 1 with the zero mark of the scale of the ruler at the bottom of the retort stand.

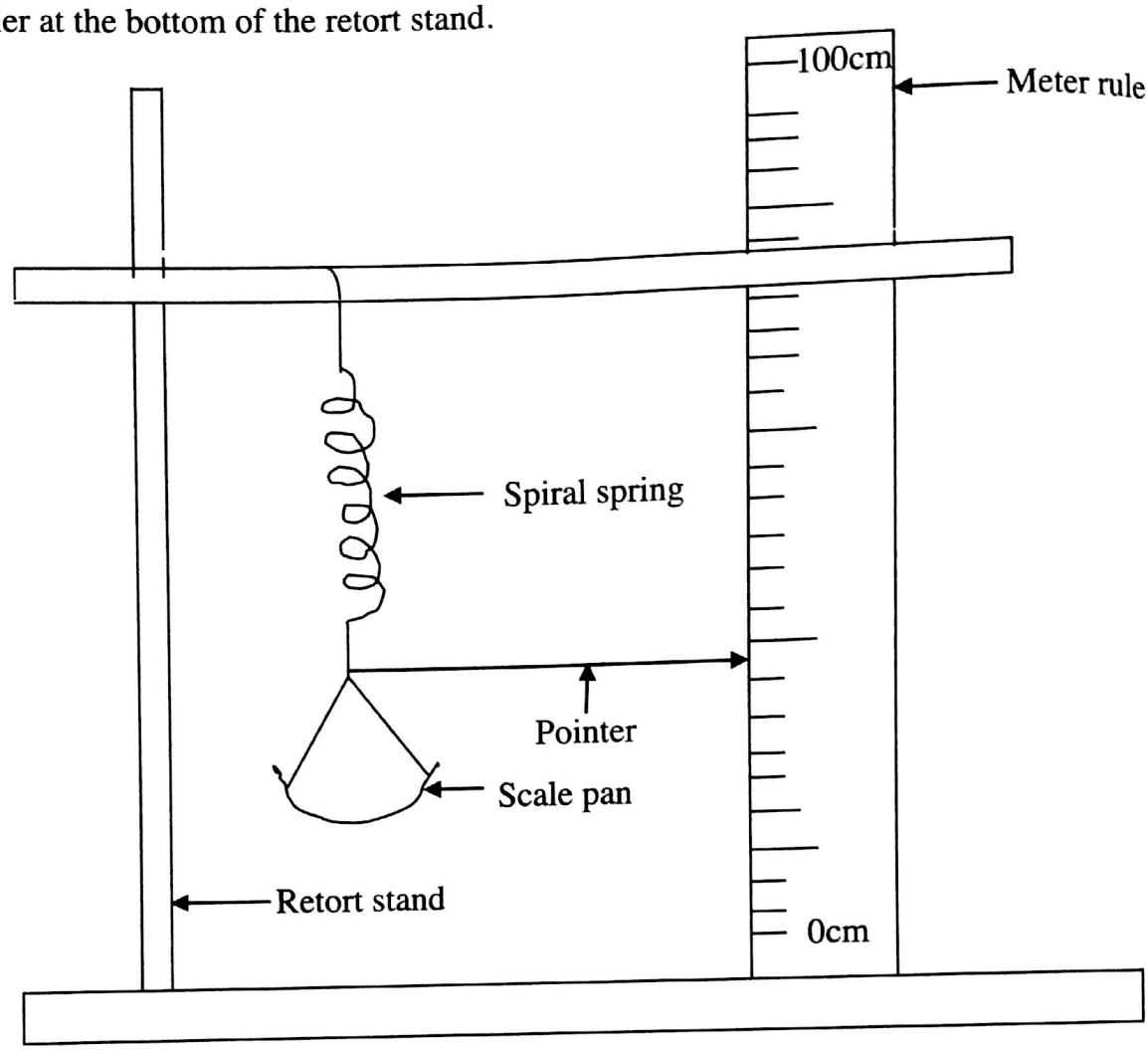

Figure 1

Record the reading of the position of the pointer on the scale of the meter rule when the scale pan is empty. Record it as d_o. Put the mass of 20g to the scale pan and record the pointer reading d.
Find the extension $e = d_o - d$.
Repeat the above procedure for the masses of 40g, 60g, 80g and 100g.

(a) Tabulate your values by making a column of mass on the scale pan, pointer reading d and extension $e = d_o - d$.
(b) Plot a graph of mass against extension.
(c) Find the slope, s, of the graph.
(d) Read the extension when the value of the mass is equal to 55g.
(e) Use the graph to determine the mass when the extension is 3cm?
(f) Suggest a suitable title of the experiment.
(g) What is your conclusion?
(h) List two possible sources of errors and three ways of minimizing these errors.

(25 marks)

2. The aim of this experiment is to determine the resistance of an electrical conductor using an ammeter and a voltmeter.

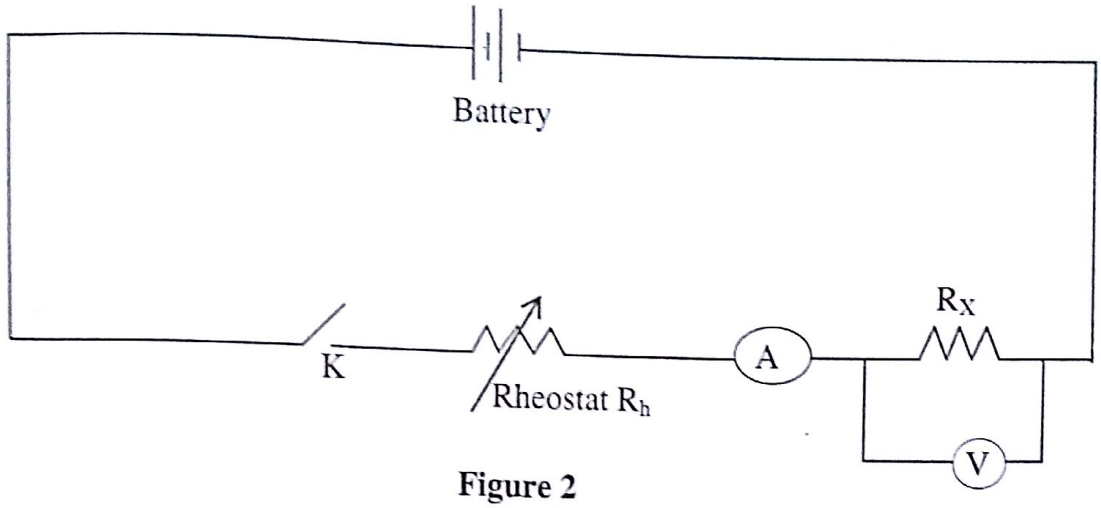

Figure 2

(a) Connect the circuit as shown in Figure 2. Close the key, K. Adjust the rheostat Rh so that a small current passes through the conductor of unknown resistance R_x.
(b) Record this current I and the potential difference V between the ends of R_X.
(c) Adjust the rheostat again to give a slightly higher current through R_X. Measure the current I and the potential difference V as in 2 (b).
(d) Repeat the experiment so as to give a total of five readings. Tabulate your results as shown in the following table.

Current I(A)	Potential difference V(volts)
0.1	
0.2	
0.3	
0.4	
0.5	

(e) Plot the graph of V against I.
(f) Determine the slope of the graph.
(g) What is the physical meaning of the slope?
(h) Deduce the value of R_X.
(i) State the law applied in the experiment.
(j) Mention any two conditions which govern the law stated in 2 (i).
(k) State any two sources of errors and any precaution taken in this experiment.

(25 marks)