P510/3

**Physics Practical**

**Paper 3**

August 2019

3¼ HRS

WESTERN JOINT MOCK EXAMINATIONS 2018

Uganda Advanced Certificate of Education

**PHYSICS PRACTICAL**

**PAPER 3**

3¼Hours.

**INSTRUCTIONS TO CANDIDATES.**

* *Answer question* ***1*** *and* ***one*** *other question.*
* *Any additional question answered will not be marked.*
* *Candidates are not allowed to use the apparatus for the first fifteen minutes.*
* *Graph papers are provided.*
* *Mathematical tables and non-programmable scientific electronic calculators may be used.*
* *Candidates are expected to record all their observations as they are made and plan the presentation of the records, so that it is not necessary to make a fair copy of them.*
* *The working of the answer is to be handed in*
* *Details of the question paper should not be repeated in the answer, nor in the theory of the experiment required. Candidates should, however, record any special precautions they have taken and any particular feature of their method of going about the experiment.*
* *Marks are given mainly for a clear record of the observations actually made, for their suitability and accuracy and for the use made of them.*

1. In this experiment, you will determine the constant, **K** of the spiral spring provided.

**Part 1**

1. Balance the metre, Q on a knife edge with its graduated face upwards and note the position, G of balance.
2. Measure and record in metres the distance of the knife edge from the hole, H
3. Pass an optical pin through the hole, H and then fix the pin into the rubber bung or cork provided.
4. Clamp the rubber bung or cork
5. Attach a pointer, to one end of the spring provided
6. Suspend the spring from the rod of a clamp
7. Tie a pointer, firmly to the end, B of the metre rule Q using a piece of thread
8. Tie the free end of the spring to the metre rule at the 99.0cm mark as shown in figure 1.
9. Adjust the position of the clamp from which the spring is suspended until the metre rule is horizontal.

*X*

•

B

Cork

M

A

scale

S

Fig. 1

1. Clamp a metre rule vertically besides pins and
2. Read and record the initial positions and of the pointers and , respectively on the scale.
3. Hang a mass on the metre rule, Q at point G using a piece of thread.
4. Adjust the positions of the clamp from which the spring is suspended until returns to its initial position.
5. Read and record the new positions of the pointer on the scale.
6. Find the extension, of the spring and record it in metres.
7. Repeat procedures (l) to (0) for values of .
8. Tabulate your results
9. Plot a graph of *e* against *M*
10. Find the slope S, of the graph
11. Determine the constant, K of the spring from the expression, , where

**PART II**

1. Remove mass M
2. Adjust the position of the clamp from which the spring is suspended until the metre rule Q is horizontal.
3. Read and record the initial position of the pointers and as and
4. Suspend a mass at a distance cm from hole, H.
5. Adjust the position of the clamp from which the spring is suspend until the pointer returns to its initial position.
6. Read and record the new position of the pointer on the scale.
7. Find the extension of the spring
8. Repeat procedures (d) to (g). for values of extension as .
9. Determine the constant, of the spring from the expression.

1. Find K from the expression

1. In this experiment, you will determine the power, of a cylindrical water lens by two methods.

**METHOD 1**

1. Measure and record the external diameter, d, of the 250ml glass beaker provided.
2. Draw, using a pen, a vertical line along the strip of paper provided.
3. Stick the strip of paper vertically on the side of the glass beaker using pieces of cellotape.
4. Align the torch bulb, beaker and the screen such that the vertical line on the beaker faces you as shown in figure 2.

White screen

Bulb Beaker

water

Vertical line

***Fig.2***

Wooden block

y

x

1. Pour water into the beaker up to the 250ml mark.
2. Adjust the distance, x, to 20.0cm
3. Adjust the position of the screen until a sharp vertical line image of the bulb is formed on it.
4. Measure and record the distance, y of the screen from the bulb.
5. Calculate the value of **,** from the expression

1. Repeat the procedure (f) to (i) for x=30.0cm.
2. Calculate the average value of .

**METHOD II**

Beaker white screen

Bulb

b

Wooden u

block y

**Fig 3**

1. Adjust the distance between the bulb and the screen to as shown in figure 3
2. Starting with the beaker near the screen, move the beaker towards the bulb until a sharp vertical line image of the bulb is formed on the screen.
3. Measure and record the distance, *u* of the beaker from the bulb.
4. Keeping, ***y***, constant, move the beaker further towards the bulb until another sharp image is formed on the screen.
5. Measure and record the new distance, *b* of the beaker from the bulb.
6. Repeat the procedures (a) to (e) for values of y = 6d, 7d, 8d, 9d and 10dcm.
7. Tabulate your results including values of .
8. Plot a graph of against *y*.
9. Find the slope, S of the graph.
10. Calculate the value of P, from the expression
11. In this experiment, you will determine a constant K of the resistor marked .
12. Connect the circuit shown in figure 3(a)

O

O

J

O

Potentiometer wire   
  
 Bare wire, W

B

A

G

*x*

Crocodile clip

x

Crocodile clip Metre rule

O

Fig. 3(a)

1. Adjust the length *x* to 0.200m.
2. Close switches and
3. Move the sliding contact J along the potential slide wire AB until a point is found where the centre zero galvanometer G shows no deflection.
4. Read and record the balance length,
5. Open switches and
6. Repeat procedure (b) to (f) for values of *x* =0.300, 0.400, 0.500, 0.600, 0.700 and 0.800m
7. Dismantle the circuit
8. Connect the circuit shown in figure 3(b).

O

O

Potentiometer wire

G

B

A

J

***x***

Metre rule Bare wire, W

O

O

Fig. 3(b)

1. Adjust the length *x* to 0.200m
2. Close switches and
3. Move the sliding contact **J** along the potentiometer wire AB until a point is found when the centre zero galvanometer G shows no deflection
4. Measure and record the balance length,
5. Open switches and
6. Repeat the procedures (j) to (n) for values of *x* = 0.300, 0.400, 0.500, 0.600, 0.700 and 0.800m
7. Record your results in a suitable table including values of
8. Plot a graph of *x* against
9. Obtain the slope S of the graph
10. Find the constant, K of the resistor from **K=10 S .**

**END**