NAME…………………………………….INDEX NO……………………..

232/3
PHYSICS
PAPER 3 (PRACTICAL)
JULY /AUGUST, 2009
TIME: 2 ½ HRS

NANDI EAST DISTRICT JOINT EVALUATION TEST 2009
Kenya Certificate of Secondary Education
Physics
Paper 3 Practical
Time: 2 ½ Hrs

QUESTION 1:
You are provided with the following apparatus: -

- Lens
- Lens holder
- Screen
- Board with cross- wire
- Source of light (candle)
- Metre rule

Proceed as follows:

(a) Estimate the focal length of the lens by focusing on a distant object

F =_____ cm   (1 mark)

(b) Set up the apparatus as shown in figure 1 such that the distance between the screen and the object (cross- wire) is equal to 4f or more than 4f)
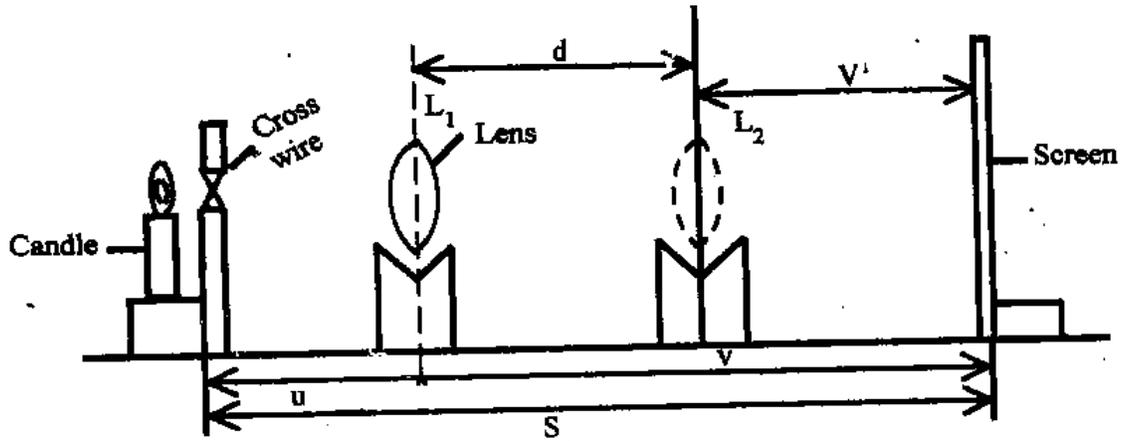

Fig 1.

Adjust the position of lens L_1 until a sharp image of the cross- wire is seen on the screen

(c) Measure the distance U and V and record in the table 1 below

(d) Move the lens to a new position L_2 close to the screen, adjust the position of the lens until another clear image of cross wire is obtained

(e) Measure the new distance V^1 and hence calculate the displacement $d = V - V^1$ and record in table 1 below

(f) Increase the distance S between the screen and the object in steps of 2cm and repeat steps (b),(c), (d), and (e) above.
    Complete the table below   (9 marks)

S	V	V^1	D	$S^2 - d^2$
40				
42				
43				
44				
46				
48				
50				

(g) Plot a graph of $S^2 - d^2$ (Y- axis) against S

(h) Determine the slope of the graph   (2 marks)

(i) Given that the equation of the graph is $K = \dfrac{S^2 - d^2}{4S}$, determine the value of K

(2 marks)

(j) What is the significance of the constant K   (1 mark)
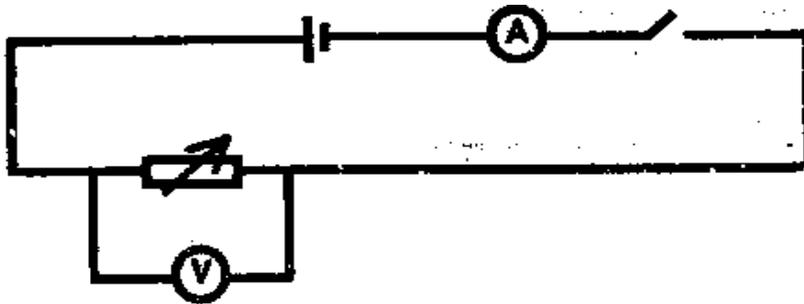
QUESTION 2
PART A:

You are provided with the following:
- dry cell and a cell holder
- one ammeter
- one voltmeter
- a variable resistor
- a switch
- connecting (b)

Proceed as following:

(a) Set the circuit as shown in figure 2 below

(b) Close the switch and adjust the variable resistor until the voltmeter reeds the maximum possible value.   Read and record   the value of V   and the corresponding value of 1 in table 2

Maximum V_0 =_____ I_0 _____ (1 mark)

(c) Repeat the procedures in (b) above for other values V shown in table 2. Complete the table 2 below   (3 marks)

TABLE 2

V(Volts)		1.35	1.30	1.20	1.10	1.00	0.95
L(A)							

(d) Plot a graph of V(Y – axis) against l   (4 marks)

(e) Given that E = V+ Ir, determine from the graph

(i) The e.m.f of the battery   (1 mark)

(ii) The internal resistance of the battery   (1 mark)

PART B
You are provided with the following: -

- Metre rule
- Knife edge
- Rubber bands
- 15 iron nails
- Thread
- 50g mass
- Water
- Beaker 250ml

Proceed as follows:
(g) Balance the metre rule on a knife edge provided, with the graduated face upwards at the 50cm mark. If it does not balance horizontally, make it do so by placing rubber bands tightly at suitable distance. Te band should not be moved afterwards.

(h) Tie the nails into a firm bundle with thread and hang them from the left hand side of the metre rule. Hand the 50g mass on the right hand side at the 80cm mark as shown in figure 3.
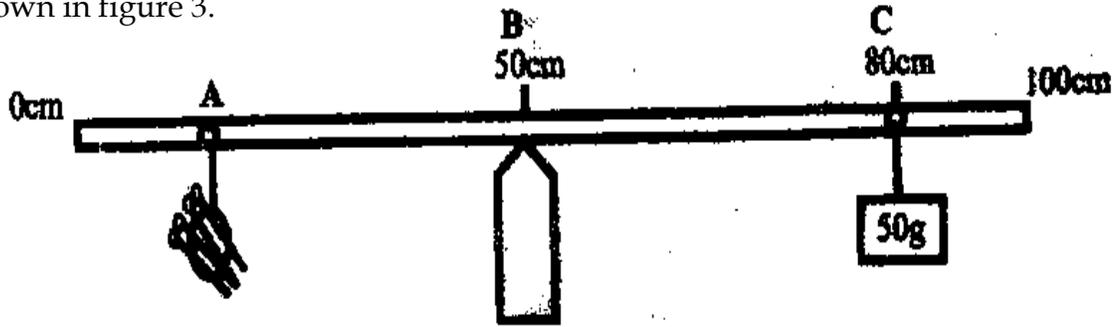

Fig. 3

(i) Adjust the position of the nails until the scale balances horizontally

(j) Measure the distances AB and BC and fill table 3 below.

(k) Calculate the weight of the nails W_1 given that $W_1 = \dfrac{\frac{1}{2} BC}{BC}$ (3 marks)

Repeat (h(, (i), (j), and (k) above for other values of BC as indicated.

AB (cm)	BC(cm	W_1
	30	
	25	
	20	

Calculate the average value of W_1 (1 mark)

(I)   Balance the metre rule with the nails submerged in water when the distance BC = 30cm as shown in figure 4 below
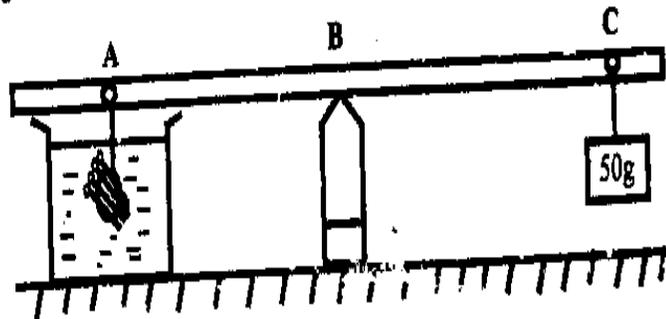
Measure AB and calculate the apparent weight $W_2 = \dfrac{\frac{1}{2} BC}{AB}$ Record your values in table 4 below   (3 marks)

Repeat for other values of BC as shown in the table

AB(cm)	BC(cm)	W_2
	30	
	25	
	20	

Calculate the average value of W_2 (1 mark)

(c)