NAME:……INDEX ……..…..DATE……..…
SCHOOL:……SIGNATURE……

232/3
PHYSICS
PAPER 3
JULY / AUGUST, 2010
2½ HOURS

KISUMU NORTH AND EAST DISTRICTS JOINT TEST
Kenya Certificate of Secondary Education 2010

232/3
PHYSICS
PAPER 3
JULY / AUGUST 2010

INSTRUCTIONS TO CANDIDATES

- *Write your name and index number in the spaces provided above*
- *Sign and write the name of your school and date of examination in the spaces provided above*
- *Answer **all** the questions in the spaces provided in the question paper*
- *You are supposed to spend the first 15 minutes of the 2½ hours allowed for this paper reading the whole paper carefully before commencing your work.*
- *Marks are given for a clear record of the observations actually made, their suitability, accuracy and the use made of them.*
- *Candidates are advised to record their observations as soon as they are made*
- *Non-programmable silent electronic calculators and KNEC mathematical tables may be used*
- *Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.*

For Examiners Use Only

Total

Question 1	d	e (i)	e (ii)	e (iii)
Maximum Score	10	5	3	2
Candidate's Score				

Total

Question 2	h	i	j	k
Maximum Score	9	5	3	3
Candidate's Score				

Grand Total

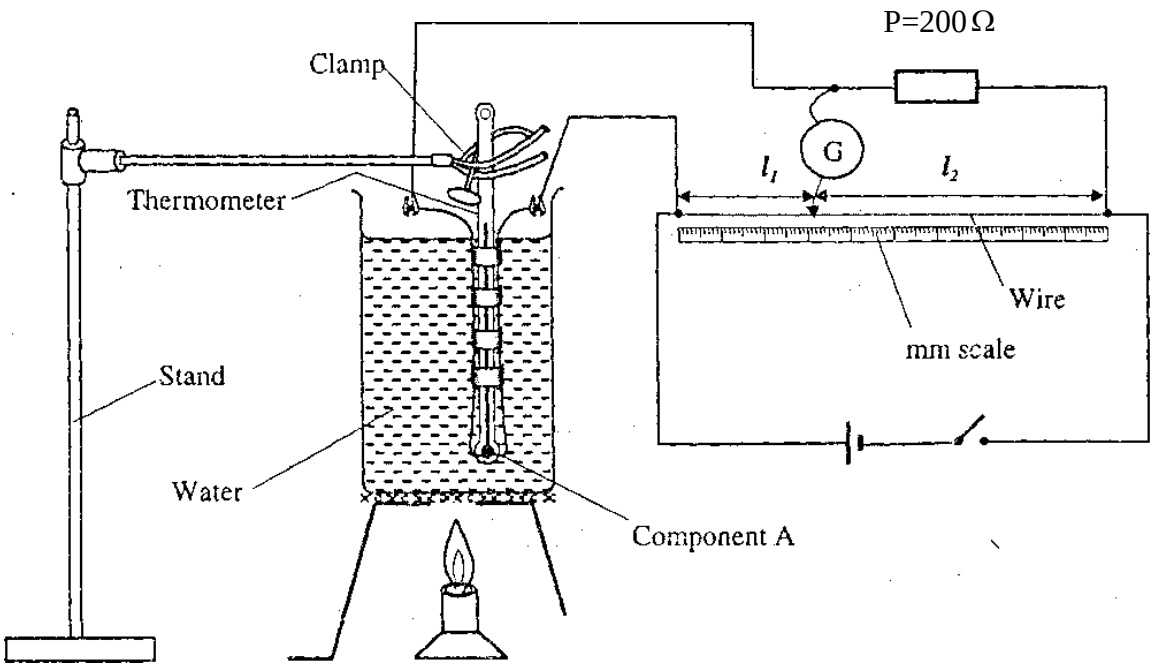
1. You are provided with the following:
- a galvanometer
- a jockey
- a cell and a cell holder
- a fixed resistor P = 200 Ω
- a switch
- component A attached to thermometer

- a straight wire of length 1.0 m mounted on a millimeter scale
- Source of heat
- a boss, a clamp and a stand
- a tripod stand and a wire gauze
- connecting wires
- a beaker and some water

Proceed as follows:

(a) Set up the apparatus as shown in figure 1. **Do not light the burner at this point.**

Figure 1



The thermometer and component A are mounted so that they do not touch the sides or the bottom of the beaker. The scale of the thermometer should face the candidate.

(b) Close the switch and use the jockey to touch one extreme end of the mounted wire. The galvanometer should deflect to one side. Now use the jockey to touch the other extreme end of the wire. **The galvanometer must deflect in the opposite direction.**
If the galvanometer does not deflect or the deflections are in one direction only, then the circuit should be checked.
Now locate the position on the wire where the galvanometer shows no deflection (zero deflection). This is the balance point before heating the water. Record the value of this temperature, and the corresponding value of T in the blank space in table 1. Record also the values of l_1 and l_2.

(c) Heat the water and locate the balance point when the temperature ɵ = 30°C. **(It is advisable to start locating the balance point just before the temperature reaches 30°C).**
Record the values of l_1 and l_2 (see figure 1) in the table 1. **If the temperature of the water before heating, is 30°C or more, heat the water to 40^{0}C** and proceed.

(d) Repeat the procedure in (c) for the other values of temperature shown in table 1. Complete the table. (The resistance of component A is R_A).

ɵ (^{0}C)		30	40	50	60	70	80
T = (273 + θ)							
$Log_{10}T$							

$l_1(cm)$							
$l_2(cm)$							
$R_A = 200 \times \frac{l_1}{l_2}$							
$Log_{10} R_A$							

Table 1 (10mks)

(e) (i) On the grid provided plot a graph of $\log_{10} R_A (y-axis)$ against $\log_{10} T$. [You may use the following ranges on the axes: $1.50 \le \log_{10} R_A \le 2.60 and 2.45 \le \log_{10} T \le 2.55$] (5 marks)

(ii) Given that $\log_{10} R_A = n \log_{10} T + K$, use the graph to determine the value of n.

(3 marks)

(iii) Determine the temperature T at which the resistance R_A is equal to 200Ω. (2 marks)

2. You are provided with the following:

two lenses marked A and B mounted at the ends of a lube
the tube mounted on a stand
a light source, O, with connecting wires
three dry cells and cell holder
a retort stand and a clamp
a metre rule
a white screen
a switch.

Proceed as follows:

(a) Set up the apparatus as shown in figure 2.

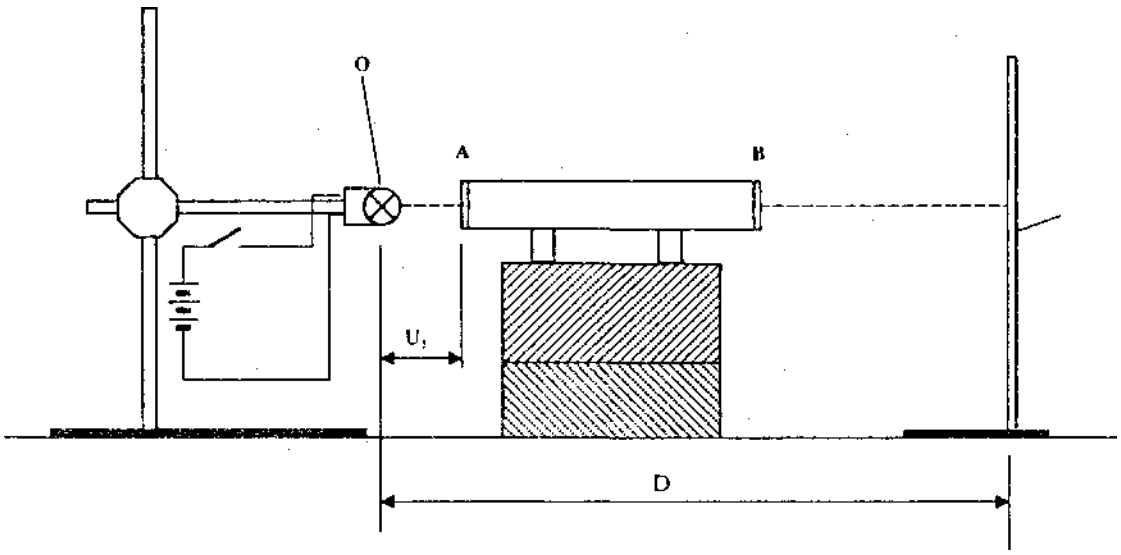


Figure 2

Adjust the light source so as to be on the principal axis of the lens system.

(b) The distance between O and A is U_1. Set U_1 = 6cm.
(c) Switch on the light source and adjust the screen, (by moving the screen away or towards the lens system) so as to obtain a focused image.
(d) Measure and record the new distance D, between O and the screen.
(e) Without moving O and the screen move the lens system along the principal axis until another sharp image is obtained on the screen.
(f) Measure and record the new distance U_2 between O and A.
(g) Determine the displacement, d, through which the lens system has moved and record the value in table 2.

U, (cm)	D (cm)	U_2 (cm)	d (cm)	(D + d) (cm)	$\frac{d}{D+d}$	(D - d) (cm)
6						
8						
10						
12						
14						
16						

Table 2 (9 marks)

(h) Repeat steps b to g for other values of U_1 as indicated in the table. Complete the table.

(i) On the grid provided plot a graph of $\frac{d}{D+d}(y-axis)$ against $D-d$. (5 marks)

(j) Determine the slope of the graph. (3 marks)

(k) Determine the value of D when $\frac{d}{D+d}=0$ (3 marks)