NAME: ………………………………………… ADMIN NO:...…...………………………

SCHOOL………………………………………… DATE: …………...……………………...

CANDIDATE'S SIGNATURE: ……………………

232/3
PHYSICS
PAPER 3
PRACTICAL
JULY/AUGUST 2017
TIME: 2½ HOURS.

SCHOOL BASED FORM 4 EXAM JULY-AUGUST 2017

Kenya Certificate of Secondary Education.
Physics
Paper 3
Time : 2 ½ Hours

INSTRUCTIONS TO CANDIDATES.

a) Write your **NAME, SCHOOL** and **INDEX NUMBER** in the spaces provided above.
b) Sign and write the date of examination in the spaces provided above.
c) Answer **all** the questions in the spaces provided in the question paper.
d) You are supposed to spend the first 15 minutes of the 2 ½ hours allowed for this paper reading through the whole paper carefully before commencing your work
e) Marks are awarded for a clear record of the observation actually made, their suitability, accuracy and the use made of them.
f) Candidates are advised to record their observations as soon as they are made.
g) Non programmable Silent Electronic calculators and mathematical tables may be used.
h) Candidates should check the question paper to ascertain that all the pages are printed.
i) Candidates should answer the questions in English.

FOR EXAMINER'S USE ONLY.

Question 1	b	c	e	f	g (i)	g (ii)
Maximum Score	1	6	5	3	3	2
Candidate's Score						

Total

Question 2	iii	iv	v	vi	a	b
Maximum Score	2	1	1	7	1	5
Candidate's Score						

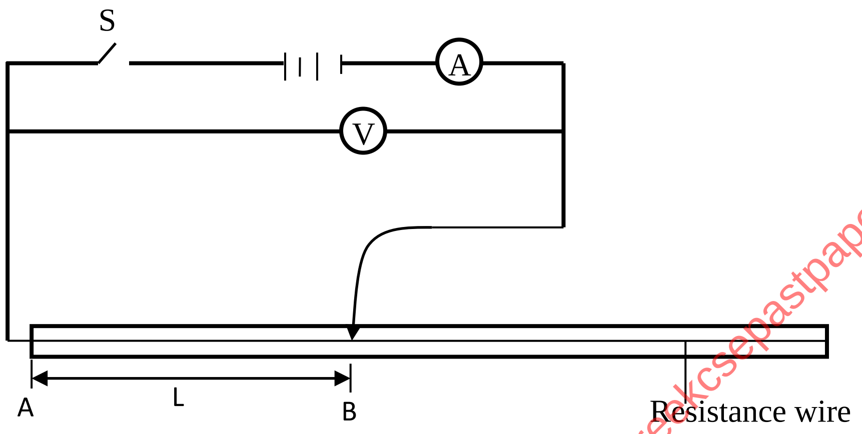
Total

GRAND TOTAL

Question 1

1. You are provided with the following
    - ✓ One jockey or crocodile
    - ✓ Two new dry cells (Size D)
    - ✓ An ammeter 0 – 1A
    - ✓ A voltimeter 0 – 5V
    - ✓ A cell holder
    - ✓ Switch, S
    - ✓ Six connecting wires at least three with crocodile clips at one end
    - ✓ A resistance wire mounted on a mm scale

    Proceed as follows
    - ✓ Set up the circuit as shown in the figure below.



- ✓ Using a micrometer screw gauge, measure the diameter, d, of the nichrome wire.
  d = ……………………………… mm (½ mk)
  d = ……………………………… mm (½ mk)
- ✓ Close the switch and place the jockey/crocodile in contact with the resistance wire such that the length, L of the wire = 0.10m. Measure and record the current, I, through the wire AB and the potential difference, pd, (V) across. Record your results in table 1 below.

L (m)	0.1	0.3	0.5	0.7	0.9
p.d (v)					
I (A)					
$R = \frac{V}{I}(\Omega)$					
$\frac{1}{I}$ (A^{-1})					

- ✓ Repeat procedure (b) above for the other values of L given in the table 1 above. Read and record the corresponding values of I and V in table 1 above.
- ✓ Plot a graph of $\frac{1}{I}$ against R. (5 mks)
- ✓ Determine the slope, S of your graph (3 mks)

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Given that $\frac{1}{I} = \frac{R}{E} + \frac{r}{g}$, determine the value of

(i) E (3 marks)

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(ii) r (2 mks)

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QUESTION 2

PART A

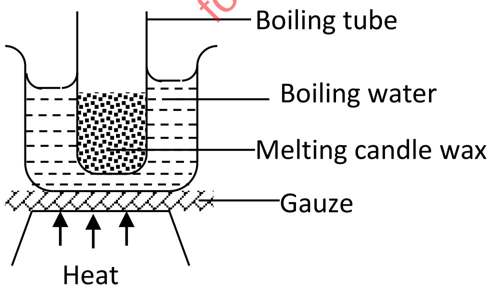
You are provided with the

- ✓ Candle wax
- ✓ Source of heat
- ✓ Stop watch
- ✓ Boiling tube
- ✓ Thermometer
- ✓ Cork with a hole or cardboard with hole
- ✓ Water
- ✓ Tripod stand
- ✓ Tube holder

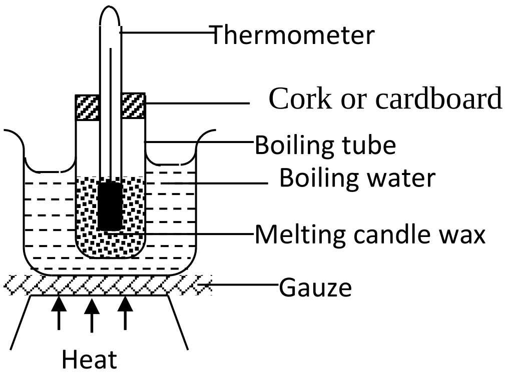
Proceed as follows:

(i) Heat the water in the beaker until it starts to boil

(ii) Place some candle wax in the boiling tube and heat the wax indirectly using the boiling water in beaker as shown in the figure below.



(iii) When the wax completely melted, continue heating for about two minutes. Meanwhile insert the thermometer in the boiling tube through the hole or cardboard. Adjust the thermometer until the bulb of the thermometer is completely immersed in melted wax.



Continue heating until the thermometer records no further change in temperature. This the maximum temperature reached. Record this temperature, as T_{max}.

T_{max} = ……………………………………….. ^0C

(iv) Now remove the boiling tube from the boiling water and simultaneously start the stop watch. Record the temperature of the cooling wax at intervals of two minutes. Record and complete Table 2 below.

Time (min)	0	2	4	6	8	10	12
Temperature (^0C)							

(v) In the axis below, plot a graph of temperature, ^0C against time, t (5 marks)

(vi) Determine the rate of cooling at t = 5 min.

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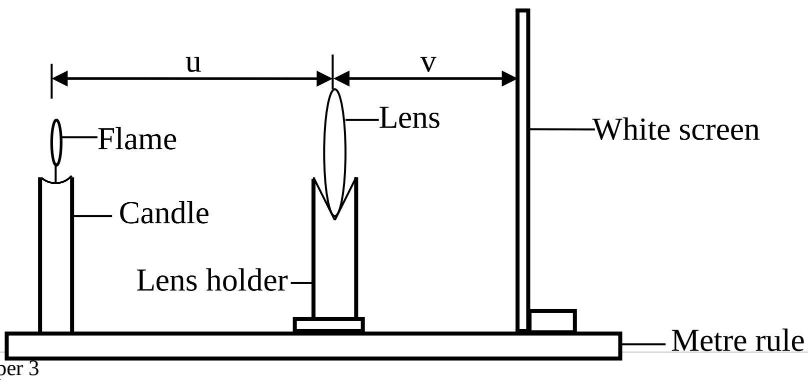
PART 2

2. You are provided with the following:
   - ✓ A candle
   - ✓ Metre rule
   - ✓ White screen
   - ✓ Lens holder
   - ✓ Convex lens
   - ✓ Match box (To be shared)

   Proceed as follows

   (a) Place the lens on a metre rule. Arrange the set up as shown in the figure below.



(b) Adjust the position of the lens so that it is a distance u = 30cm from the candle. Adjust the position of the screen until a well focused image of the flame is formed on the screen. Measure and record in the table 2, the image distance v, between the screen and lens.

(c) Repeat part (b) for other values of (u) shown in the table 3 and complete the table.

u (cm)	30	35	40
v (cm)			
$x = \frac{v}{u}$			
$y = \frac{v}{(x+1)(cm)}$			

Determine the mean value of y (2 mks)

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