Name: ………………………………………………………… Index No. …………………………

School: ……………………………………………………. Candidate's Sign. …………..............

Date: ………………………………........................................

**232/3**
**PHYSICS**
**PRACTICAL**
**PAPER 3**
**MARCH/APRIL 2011**
**TIME: 2 ¼ HOURS**

# BUTERE EAST ZONE JOINT EVALUATION TEST

*Kenya Certificate of Secondary Education (K.C.S.E.)*

**Physics**
**Paper 3**

## INSTRUCTIONS TO THE CANDIDATES:

- Write your **name** and **index number** in the spaces provided above.

- Answer *all* questions in the spaces provided in the question paper.

- You are supposed to spend the first 15 minutes of the 2 ¼ hours allowed for this paper reading the whole paper carefully.

- Marks are given for a clear record of the observation actually made, their suitability, accuracy and the use made of them.

- Candidates are advised to record their observations as soon as they are made.

- Mathematical tables, slide rules and calculators may be used.

- Take $\pi = 3.14$ and gravitational acceleration $g = 10m/s^2$

- Record your observations as soon as you make them.

## For Examiners' Use Only

| Question 1 | c | e | f |
|---|---|---|---|
| Max. score | 1 | 8 | 11 |
| Candidate's score | | | |
| **Total** | | | |

*This paper consists of 7 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.*
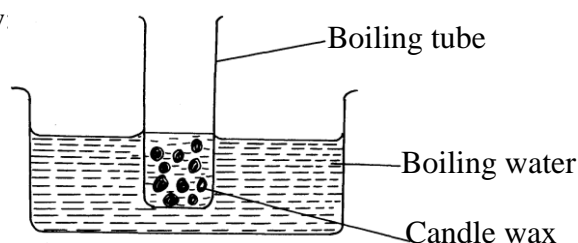
1. ***You are provided with the following apparatus***:

- Candle wax

- Source of heat

- Stop watch

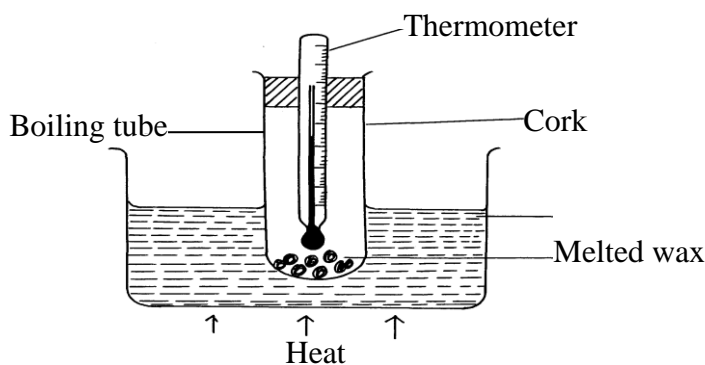- Boiling tube

- Thermometer

- Cork with a hole

- Water

***Procedure:***

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

(b) Place some candle wax in the boiling tube and that the wax indirectly using the boiling water as shown below:

(c) When the wax has completely melted, continue heating for about two mites. Meanwhile insert the thermometer in the boiling tube turning the hole in the cork. Adjust thermometer until the bulb of the thermometer is completely immersed in the melted wax.

Continue heating until the thermometer records no further change in temperature.

This is the maximum temperature reached. Read and record this temperature as $T_{max}$.

$T_{max}$ = …………………°C                                                                (1mk)

(d) Now remove the boiling tube from the boiling water and simultaneously start the stop watch. Record the temperature of the cooling wax at an interval of two minutes.

(e) Record your data in the table below;

| Time (min) | 0 | 2 | 4 | 6 | 8 | 10 | 12 | 14 |
|---|---|---|---|---|---|---|---|---|
| Temperature, $\theta$(°C) | | | | | | | | |

(f) (i) Plot a graph of temperature $\theta$(°C) (y-axis) against time, **t**                    (5mks)

(ii) Determine the rate of cooling where t = 5min from your graph. (3mks)

(iii) What would be the temperature of wax after 9.6minutes? (2mks)

(iv) During heating, there was no further change n temperature $T_{max}$. Explain. (1mk)

2.  (a) *You are provided with the following;*

- Metre rule
- Knife edge
- One 100g mass
- One 50g mass
- Two 20g mass
- One 10g mass
- Two strings

(i) Set the apparatus metre rule in equilibrium. Record the point of balance **X** of the metre rule

(*when no mass sis attached to it*) **X** = ……………………………cm (1mk)

(ii) Arrange the apparatus as shown below;
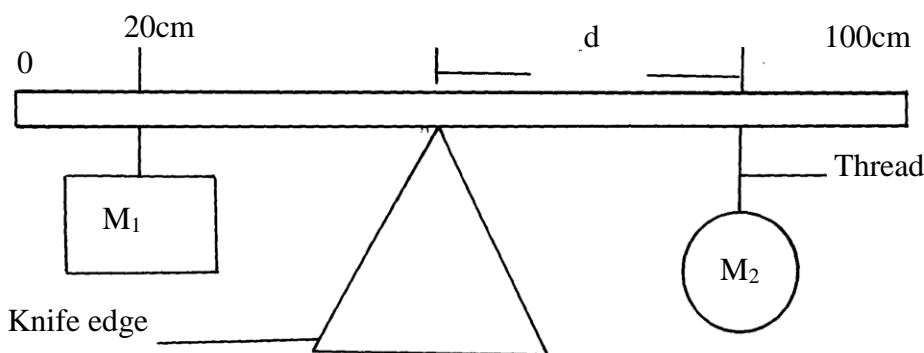


(iii) Place the 100g mass **M₁** at the 20cm mark of the metre rule with the aid of the thread.

The knife edge is placed at 40cm mark of the metre rule.

(iv) Balance the metre rule by using the mass, **M₂** = 50g. Record the distance **d**, in centimeters

for the 100g mass, **M₁**.

(v) Repeat the procedure (iii) and (iv) for different masses shown in the table below;

| Mass $M_2$(g) | 100 | 120 | 140 | 150 | 170 |
|---|---|---|---|---|---|
| Distance d(cm) | | | | | |

Complete the table (3mks)

(v) On the grid provided, plot a graph of **m**, (vertical axis) against **d**. (5mks)

Determine the gradient of the graph. (2mks)

Given that the equation of the graph is given as; $m_1 = \dfrac{m_2 d}{k} + \dfrac{m(x-40)}{k}$

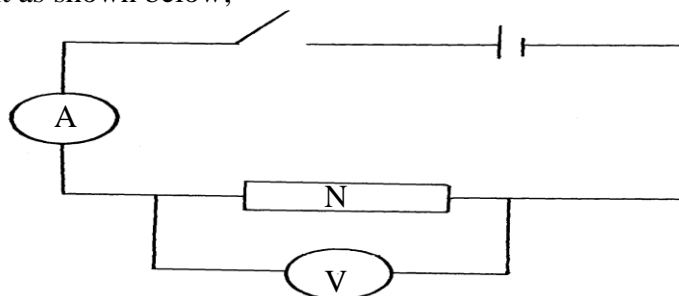Use your graph to determine the value of

**K** = ……………..………..**M** = ……………………… (3mks)

What does the value of m represent? (1mk)

(b) *You are provided with the following apparatus*:

- Six connecting wires
- 36cm long wire coiled on a wooden rod, labeled **N**
- Ammeter
- Voltmeter
- Micrometer screw gauge
- One dry cell
- Switch '**S**'

(i) Connect the circuit as shown below;



(ii) Using a micrometer screw gauge measure the thickness of the wire labeled N.

Diameter = ……………………..mm

   = ……………………..m

(iii) Calculate the cross-sectional area of wire **N**        (1mk)

(iv) Close the switch and record the ammeter and voltmeter reading.

Ammeter reading = ……………….….**A**       (1mk)

Voltmeter reading = ……………………….**V**     (1mk)

Calculate the value of **b** from the equation given that **L** is the length of the wire, **I** the ammeter reading and **V**, the voltmeter reading; $A = \dfrac{bIL}{V}$    (1mk)