NAME………………………………………………. ADM/NO………….. INDEX NO………….CLASS………..

Date done	
Invigilator	
Date returned	
Date revised	

NYABURURU GIRLS' NATIONAL SCHOOL

OUR LADY OF LOURDES

232/3
PHYSICS
(PRACTICAL)
PAPER 3
Time: 2 ½ hours

MARCH SERIES EXAMINATION-2016
Kenya Certificate of Secondary Education

INSTRUCTIONS TO CANDIDATES:

1. Write your name, index number and school in the spaces provided above.

2. Sign and Write the date of examination in the spaces provided above.

3. This paper consists of two questions

4. All answers and working must be written on the question paper in the spaces provided below each question.

5. Non-programmable silent electronic calculators and **KNEC** Mathematical tables may be used unless stated otherwise

FOR EXAMINER'S USE ONLY:

Question		Maximum score	Candidates' score
Q1		20	
Q2		20	
Total score		40	

QUESTION ONE

1. a) You are provided with the following apparatus:
   -Plane mirror
   - Rectangular glass block
   - Soft board
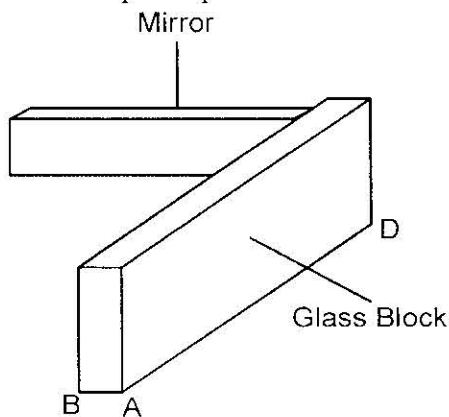   - Plain paper
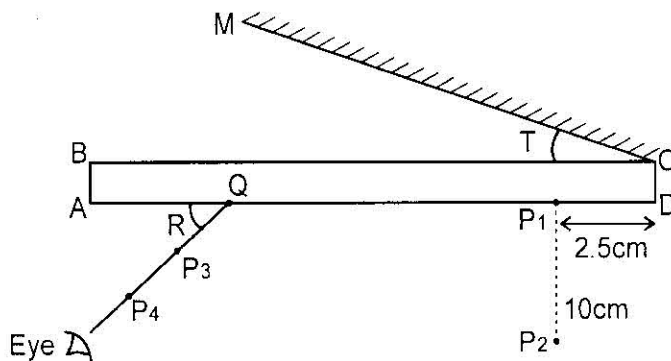   - Four optical pins

Mirror

Glass Block

Fig 1(a)

Fig 1(b)

i) With the glass block standing on one of its longer edges as shown in fig 1(a), trace its outline to obtain ABCD as shown in fig 1(b).

ii) Draw the line MC at an angle $T = 10°$.

iii) Fix pins P_1, 2.5cm from point D and another pin P_2, 10cm from pin P_1 as shown in fig 1(b). The pins must be left at these positions throughout the experiment

iv) Replace the glass block and using a small piece of plasticine; hold the plane mirror vertically along CM, behind the glass block.

v) Insert pins P_3 and P_4 such that they are in straight line with the images of P_1 and P_2 as seen through the glass block after reflection from the plane mirror.

vi) Draw a line joining P_3P_4 to meet the block at Q.

vii) Measure and record the value of angle R.

viii) Repeat steps (ii- vii) to obtain other values of R when T is at angles 15°, 20°, 25°, 30° and 35° and record the results in the table below.   (6 marks)

T	10°	15°	20°	25°	30°	35°
R(°)						

ix) Plot a graph of R against T.   (5 marks)
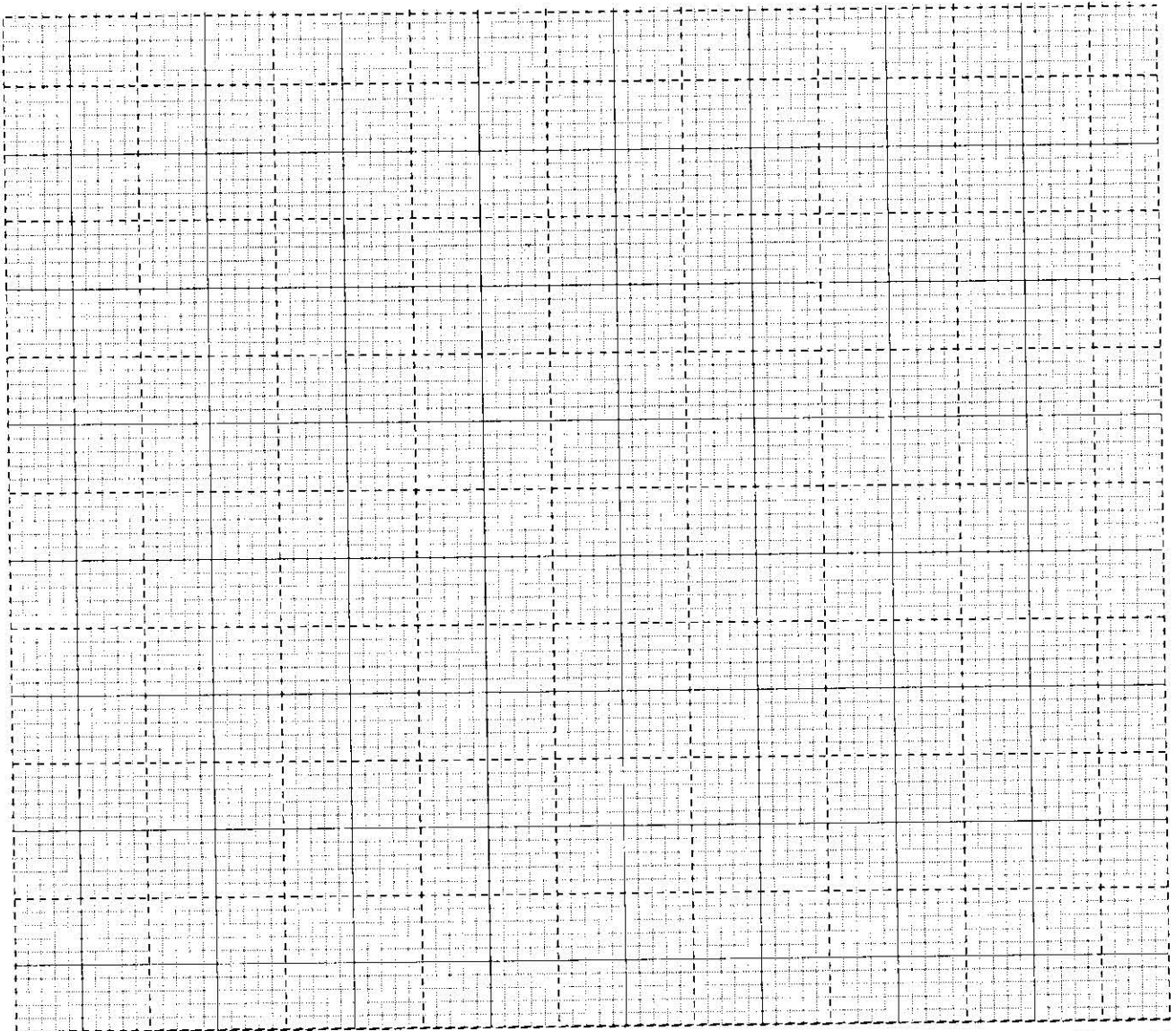
x) Determine the value of T_0 of T when R = 0. (1 mark)

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xi) Determine the value of n in the given equation. (2 marks)

$$n = \frac{1}{Sin(90^0 - T_0)}$$

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(b) You are provided with the following apparatus:
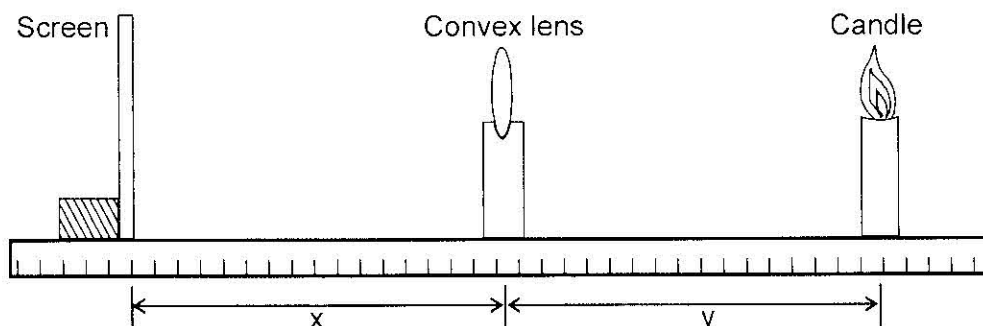- Candle
- Screen
- A meter rule
-Convex lens and lens holder

Fig 2

i) Set up the apparatus as shown in fig 2.
ii) Set the object distance y =25cm. By adjusting the position of the screen, obtain a sharp image of the candle. Record the value of image distance X.
  Repeat the procedure for y = 35cm.
iii) Complete the table below.   (3 marks)

y cm	25	35
x cm		
(x + y) cm		
(xy)cm^2		

iv) Calculate the average value of f using the equation $f = \dfrac{xy}{x + y}$ (2 marks)

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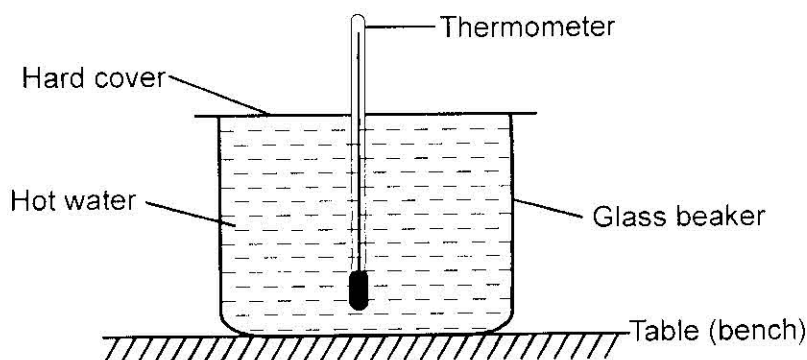
QUESTION TWO
(a) You are provided with the following apparatus.
- Hot water source
- Glass beaker (200cm^3), diameter about 5.0cm
- Thermometer (0- 100°C)
- Stop watch
- Plastic measuring cylinder (100ml)
- Hard cover plate with hole to fit thermometer

i) Measure and record the room temperature.

θ_R = ...   (1 mark)

ii) Measure exactly 150ml of the hot water using the measuring cylinder. Quickly transfer the water into the glass beaker and cover it with the hard board plate. Place the beaker on a wooden table and insert the thermometer through the hole on the cover.

iii) Measure and record the temperature θ of the cooling water after every two minutes for at least 20 minutes. Stir gently using the thermometer before every temperature reading. Record the values of temperature θ in the table below.   (4 marks)

Time, t (min)								
Temperature θ(°C)								

iv) Plot a graph of temperature θ against time t.   (5 marks)
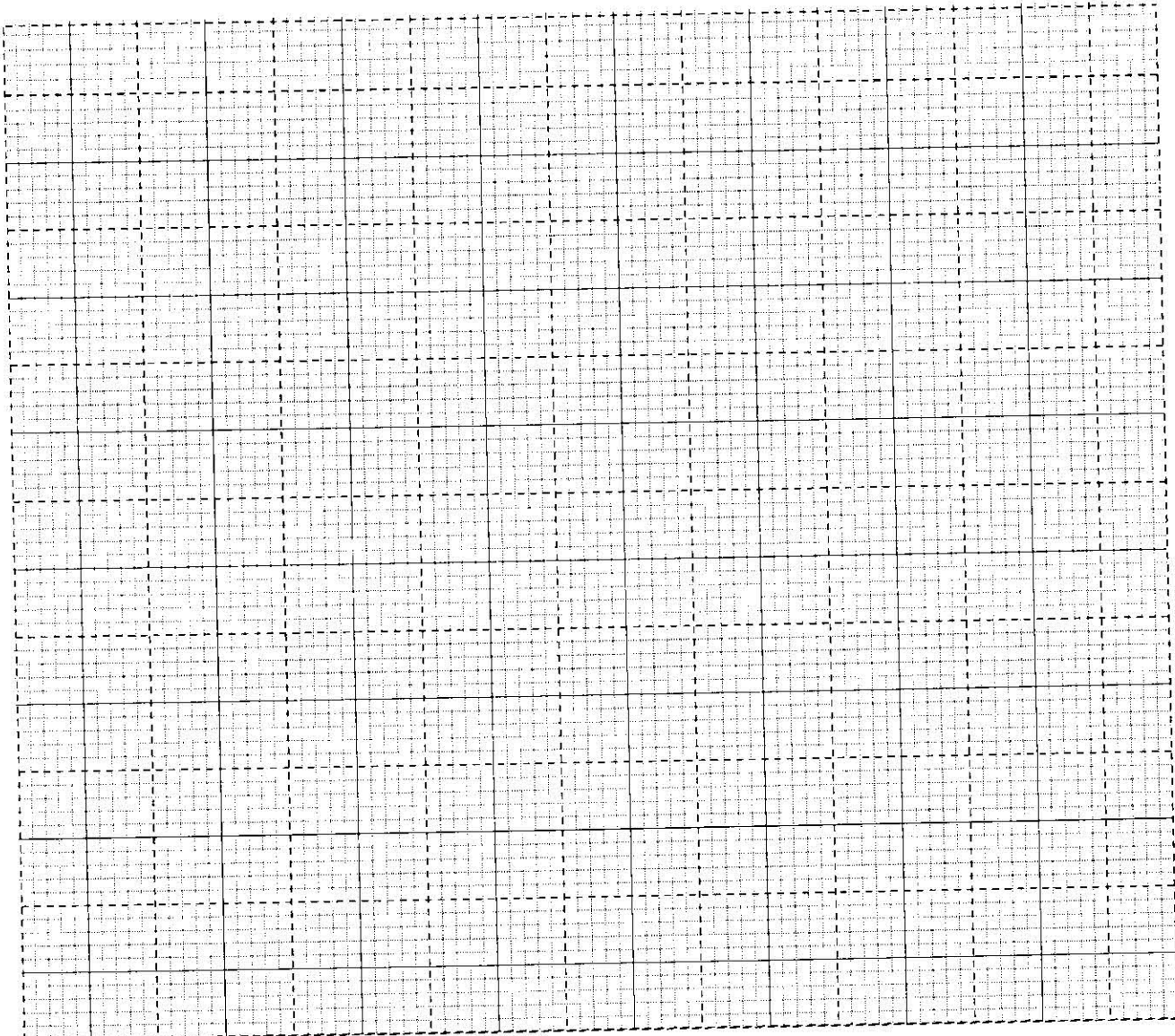
vii) From the graph determine the average rate of change of temperature between t=24min and
    t=45min.   (3 marks)

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viii) Find the slope of the graph at t=75 minutes.   (3 marks)

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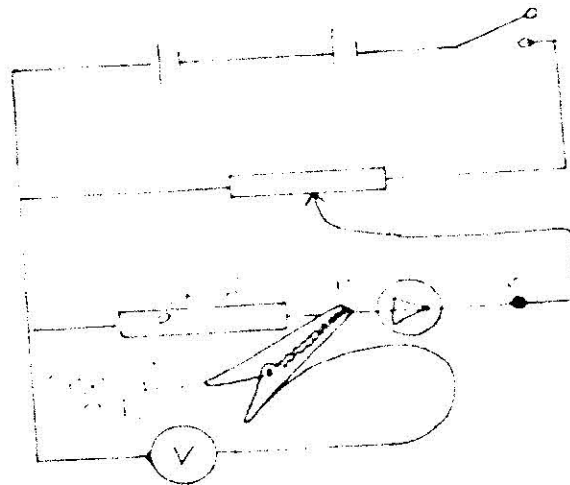..

(b) You are provided with the following apparatus.

- A diode.
- A voltmeter.(0-2.5V)
- A potentiometer.
- 8 connecting wires, one with a crocodile clip at one end.
- 2 dry cells and a cell holder.
- 1 kΩ carbon resistor.

Proceed as follows:

(xi) Set up the apparatus as shown in the figure below. Close the switch

(xii) Starting with the crocodile clip connected to terminal A, adjust the potentiometer until the voltmeter reads 1.20 volts. Now move the crocodile clip to terminal B. Record the new voltmeter reading.

(1 mark)

p.d = _____ V

(xiii) Given that the value of the carbon resistor P is 1 kΩ, calculate the current I_R through the resistor in amperes.

(1 mark)

I_R = _____ A

(xiv) Calculate the p.d V_d across the diode from your results in part (xii) above.

(1 mark)

Vd = _____ V

(xv) Determine the resistance R_d of the diode given that

(2 marks)

$$R_d = \frac{V_d}{I_1} = \underline{\hspace{3cm}} \Omega$$

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