NAME.....INDEX NO.....CLASS.....SIGN.....

NYABURURU GIRLS' NATIONAL SCHOOL

OUR LADY OF LOURDES

Date done	
Invigilator	
Date returned	
Date revised	

232/3

PHYSICS

(PRACTICAL)

PAPER 3

Time: 2 ½ hours

January 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	

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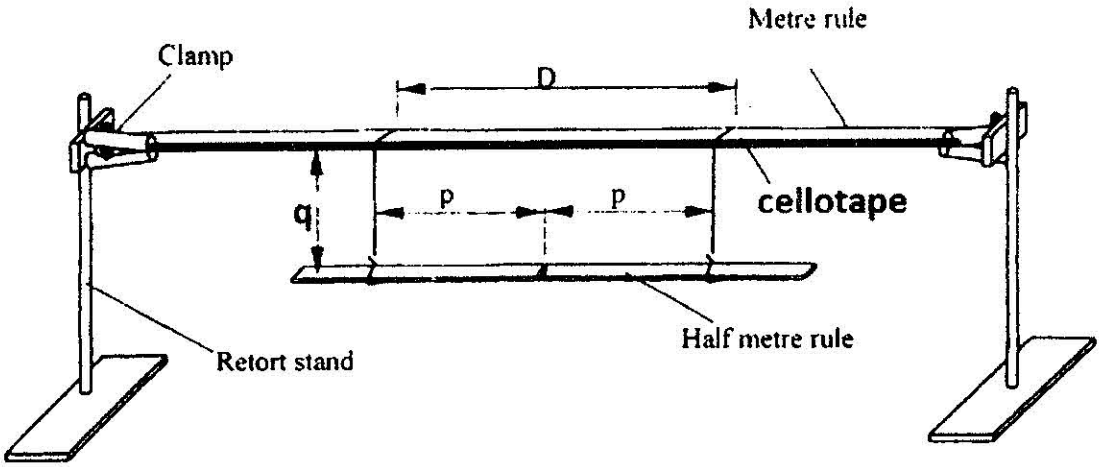
1. You are provide with the following:
   - Two metre rules.
   - One half metre rule
   - A pair of vernier calipers (to be shared)
   - A stop watch or stop clock
   - Two retort stands, two bosses and two clamps
   - Two pieces of thread
   - Some cellotape

   Proceed as follows:

   a) Measure the thickness w, of the half metre rule using the vernier calipers.

      w= .....cm .....m (1mk)

   b) Set up the apparatus as shown in figure 1 such that D = 2p = 20cm, and q = 20cm. Ensure that D is kept constant throughout the experiment. (Use a piece of cellotape to fix the threads). Ensure also that the loops of threads on the half metre rule are made such that they can slide along the rule. This would enable the adjustments of p later in the experiment.



   Note that the distance p is measured from the centre of the half -metre rule

   c) Adjust the position of the loops on the half-metre rule so that p=21cm(i.e. 2p=42cm)

You may use a piece of cellotape to keep the loop in position. Measure and record in table 1 the value of q

NB: q is the vertical distance between the half metre rule and the metre rule/wooden strip supporting it.

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g) Determine the constant k for the half metre rule given that $k = \frac{s}{\pi}\sqrt{Dg}$ where g= 10m/s^2 (2mks)

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h) Determine the constant k given $k = \frac{\sqrt{L^2 + W^2}}{12}$ where L= 0.5m (2mks)

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2. You are provided with the following:

- A rectangular glass block.
- 4 optical pins.
- A softboard.
- A plain paper.

Proceed as follows:

(a) Place the glass block on the plain paper with one of the largest face upper most. Trace round the glass block using a pencil as shown below.

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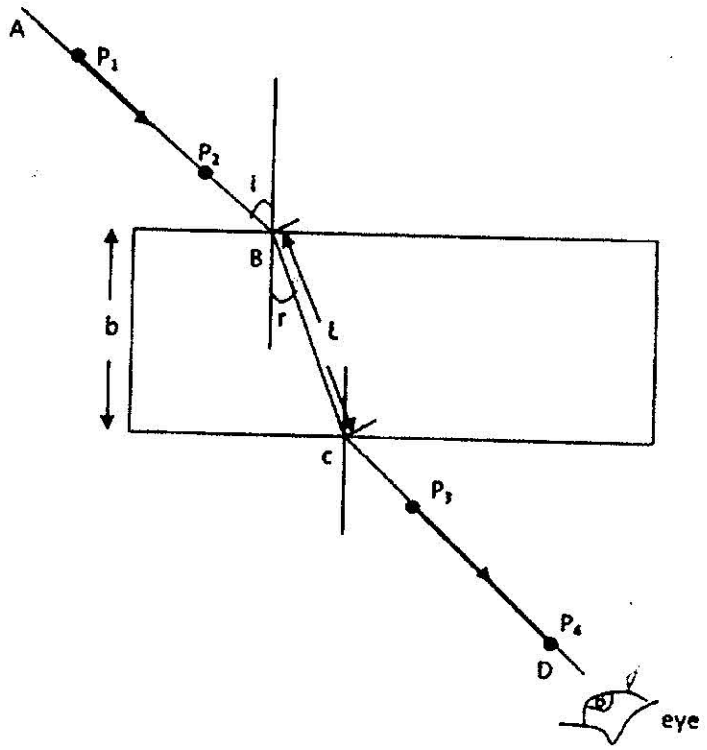

(b) Remove the glass block and draw a normal at B. Draw an incident ray AB of angle of incidence, i = 20°.

(c) Replace the glass block and trace the ray ABCD using the optical pins.

(d) Remove the glass block and draw the path of the ray ABCD using a pencil. Measure length L and record it in the table below.

$angle\ (i^0)$	20	30	40	50	60	70
$L(cm)$						
$L^2(cm^2)$						
$\frac{1}{L^2}(cm^{-2})$						
$\sin^2 i$						

(e) Repeat the procedure above for the angles of incidence given. (6mks)

NOTE: Hand in your constructions on the plain paper together with the answer script.

(f) Calculate the value of L^2 and $\frac{1}{L^2}$; Record in the table. (3mks)