Name: _____**Index No.** _____ /_____

Candidate's Signature _____ **Date:** _____

232/3

PHYSICS

Paper 3

(PRACTICAL)

TIME: 2 ½ hours

KASSU JET EXAMINATION

JUNE 2016

Kenya Certificate of Secondary Education

PHYSICS

Paper 3

TIME: 2 ½ HOURS

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Instructions

- *Write your name and index number in the spaces provided above.*
- *Sign and write the date of examination 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 ½ hrs 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 except where stated otherwise.*
- *This paper consists of 9 printed pages.*
- *Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.*

For Examiner's Use Only

Question 1	b	d	e	f	g	h (i)	(ii) I	I	**TOTAL**	
Maximum Score	1	4	1	5	3	2	2	2	**20**	
Candidate's Score										
Question 2	**Part A**	a	b	c	d	**Part B**	c	g (i)	g (ii)	**TOTAL**
Maximum Score		1	2	5	2		3	5	2	**20**
Candidate's Score										

GRAND TOTAL

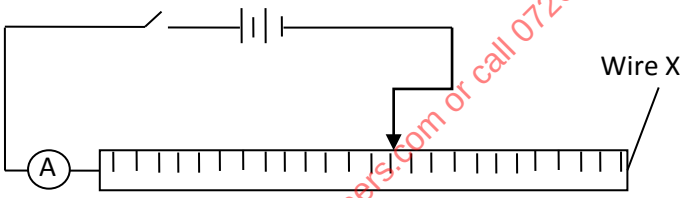
Question one

You are provided with the following:

- 2 new dry cells size D
- A cell holder
- A switch
- An ammeter
- A voltmeter
- 6 connecting wires at least three with crocodile clips
- Nichrome wire mounted on the metre rule labeld X
- A micrometer screw gauge (to be shared)

Proceed as follows

a. Connect the circuit as shown in the figure below



b. Measure the voltage, E of the dry cell before closing the switch
E=…… V (1mark)

c. Adjust the length L of the wire 0.2m, close the switch S and read the value of current and record in the table below.

Length L(m)	0.2	0.3	0.4	0.5	0.6	0.7
Current , I(A)						
$\frac{1}{I}$ **(A^{-1})**						

d. Repeat the procedure in (c) above for the value of lengths given in the table (3mks)

e. Calculate the values of $\frac{1}{I}$ and record in the table above. (1mk)

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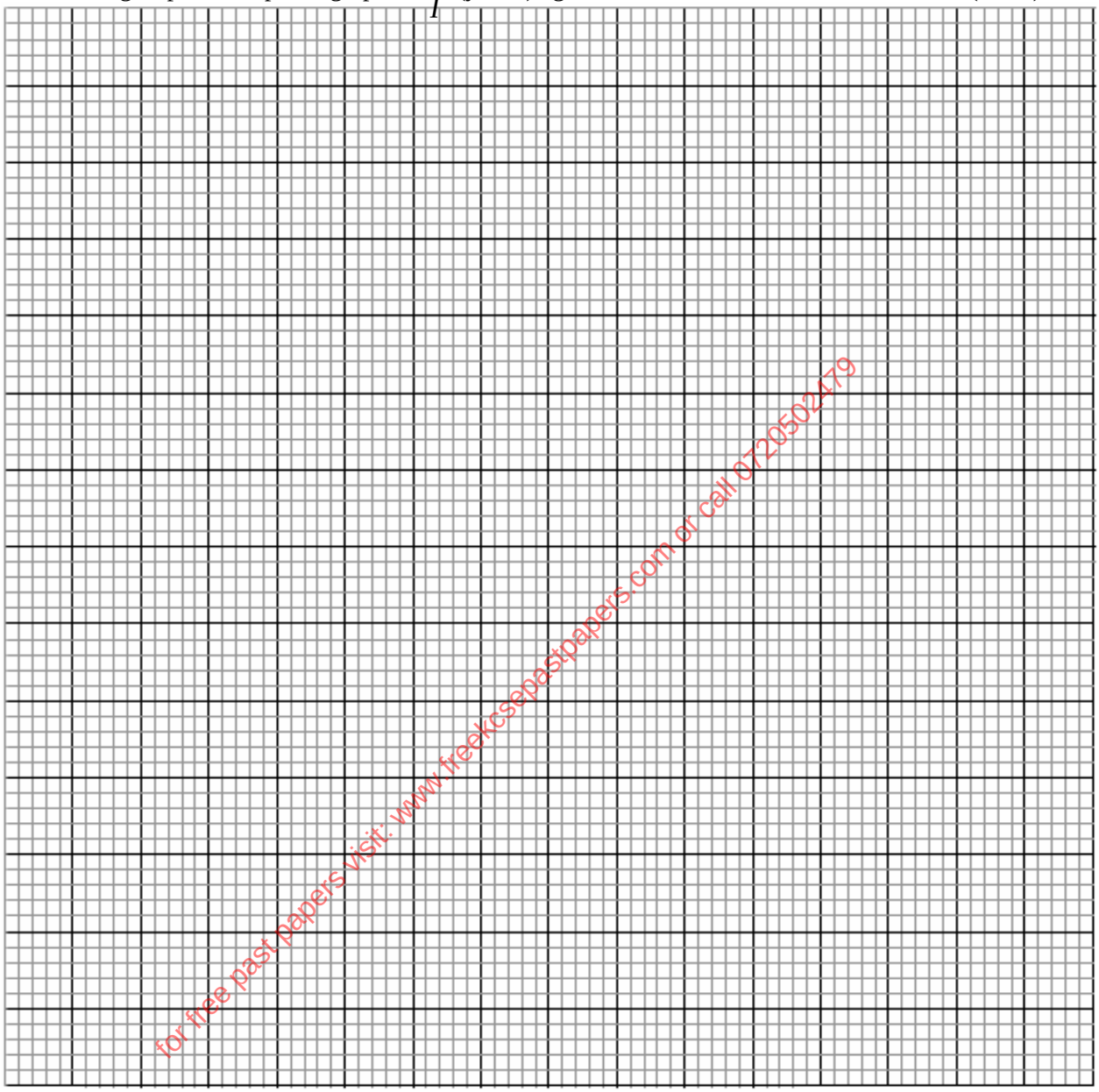
f. On the grid provided plot a graph of $\frac{1}{I}$ (y axis) against L (5mks)



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g. Determine the gradient of a graph (3mks)

h. (i) Measure the diameter dof the wire in three points used and find the average diameter.
d_1=……d_2 =……d_3…… mm (1mk)

Average d=……m (1mk)

(ii) Determine the cross section area, A of the wire (2mks)

Form the equation

$\frac{1}{I} = \frac{kl}{AE} + \frac{Q}{E}$: determine

i) The value of k (2mks)

ii) The value Q (2mks)

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Question 2
Part A
You are provided with the following

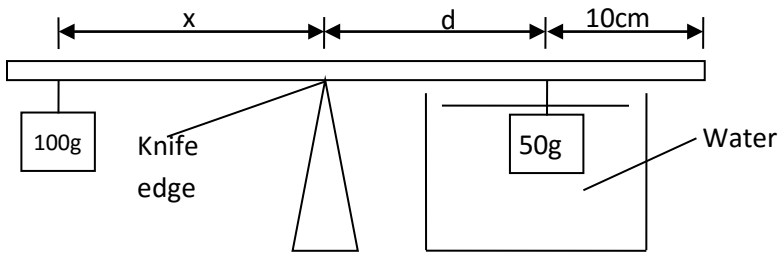
- A metre rule
- Knife edge raising 20cm above bench
- One 50g mass and one 100g mass
- Some thread
- Some water in a beaker
- Liquid L in a beaker
- Tissue paper

Proceed as follows:

a) Balance the meter rule on the knife edge and record the reading at this point.
Balance point = ……m (1mk)

For the rest of this experiment the knife edge must be placed at this position.

b) Set up the apparatus as shown in figure below. Use the thread provided to hang the masses such that the positions of support can be adjusted.



The balance is attained by adjusting the position of the 100g mass. Note that the distance x and d are measured from the knife edge and the 50 mass is fully submerged in the water. Record the values of x and d.

i) x_1 = ……cm (1mk)

d = ……..cm (1mk)

ii) Determine W_1 (weight of the object in water) (2mks)

iii) Determine the upthrust U_w in water of the 50g in water (1mk)

c) Now balance the metre rule when the 50g mass is fully submerged in the liquid L.

x_2 =……cm (1mk)

Apply the principle of moments to determine the weight W_2 of 50g mass in the liquid L and hence determine the upthrust U_L in the liquid.

W_2 (2mks)

U_L (1mk)

d) Determine the relative density R.D of the liquid L, given that

R.D = $\frac{U_L}{U_w}$ (1mk)

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Part B

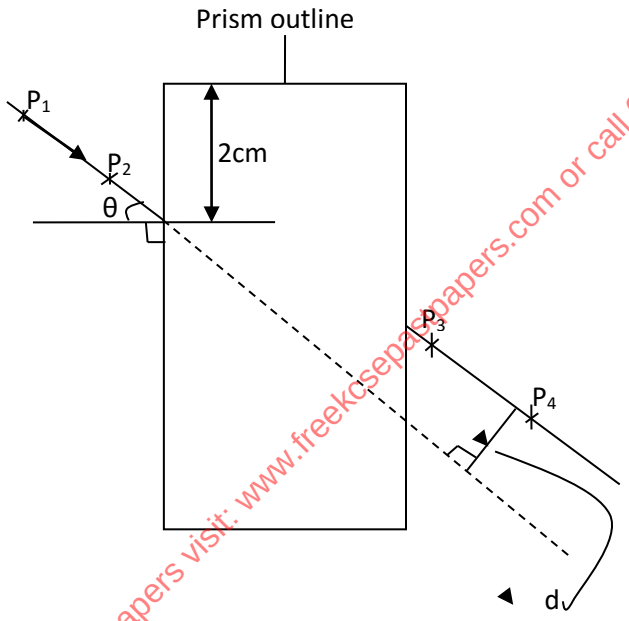
You are provided with the following

- A rectangular glass block
- Four optical pins
- A piece of soft board
- A plain sheet of paper
- Cellotape

You are also required to have your complete mathematical set.

Proceed as follows:

a) Place the plain sheet of paper on the soft board and fix it using the cellotape provided. Place the glass block at the centre of the sheet, and draw its outline. Remove the glass block. See the figure below



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Draw a normal at a point 2cm from the end of the longer side of the block outline. This normal line will be used for the rest of the experiment.

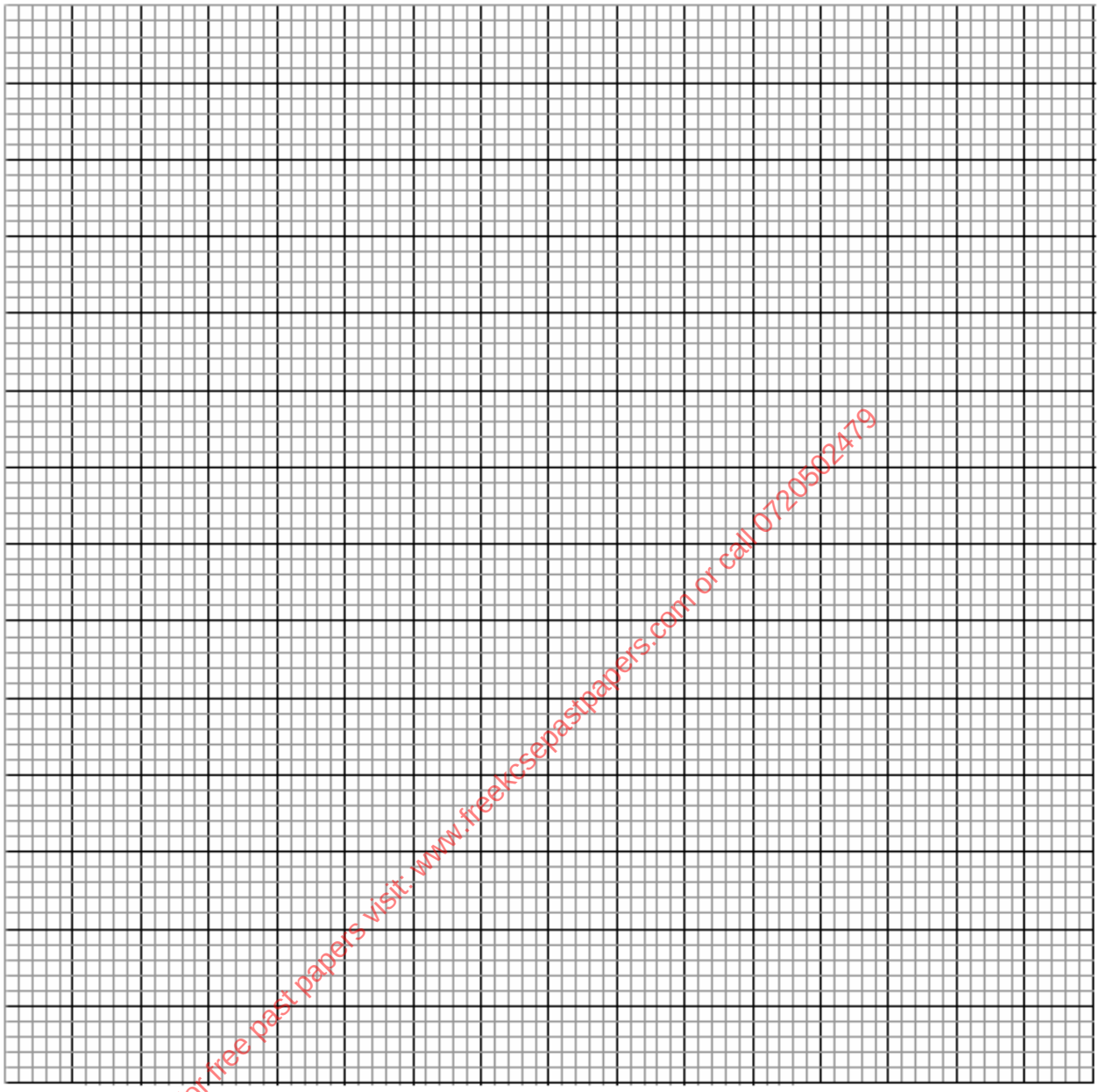
b) By viewing through the glass from the opposite side stick two other pins P_3 and P_4 vertically such that they are in line with the images of the first two pins. Draw a line through the marks made by P_3 and P_4 to touch the outline.
Measure and record in the table below the perpendicular distance **d** between the extended line and the line, P_3P_4. See figure above.

c) Record this value in the table below and repeat the process for other angles shown in the table.
NB: The sheet of paper with the drawing must be handed in together with this question paper. Ensure you write your name and index on the sheet paper.

(3mks)

Θ(deg)	25	35	40	45	55	60	65
d(cm)							

f(i) On the grid provided, plot a graph of d (y –axis) against Θ (5mks)



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(ii) Using the graph, estimate the value of d when $\Theta = 0^{o}$ (2mks)