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JULY	AŬGUST 2014
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\$ ^{fee}	GATUNDU JOINT EXAMINATION - 2014 Kenya Certificate of Education
NOTE	Physics Paper 3
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Instructions to candidates

- This paper consists of two Questions 1 and 2.
- Answer all the questions in the two Questions in the spaces provided.
- Electronic calculators, mathematical tables may be used.
- All numerical answers should be expressed in the decimal notations.

QUESTION	MAX MARKS	CANDIDATE'S SCORE
1	20	
2	20	
TOTAL	40	

Question 1 PART (A)

Apparatus

- www.freekcsepastpapers.com • Four Optical prins
- Four thumb tucks
- A Plain sheet of paper,
- A soft board
- Frectangular glass block

PROCEDURE

for More

- 1. Fix the plain white paper on soft board using drawing pins.
- 2. Place a rectangular glass block on the paper and trace its outline ABCD.
- 3. Remove the glass block and draw a normal, say at point O.
- 4. Draw a line making an angle of 30° with the normal as the incident ray.



- 5 Replace the glass block carefully to its original position.
- 6 Fix two pins p1 and p2 on the line as apart as possible.

7 Looking through the glass block and through face AB fix two pins p3 and p4 so that they are exactly in line with the images p1 and p2 as seen through the glass.



- 8 Mark the positions of p3 and p4.
- 9 Join p3 and p4 and produce the line to meet face AB of the block at O
- 10 Join O and O'
 - (i) Measure angle N'O O' (B) = (1mk)
 - (ii) Given that $k = \frac{\sin 30^0}{\sin B}$

Calculate the value of k (2mks)

What does the value k represent? (1mk)

PART B You are provided with the following apparatus

- Salt solution in a 500ml beaker
- Two identical cylindrical 100g mass
- Two pieces of thread
- A resort strand
- A Meter rule
- 🔏 knife edge

(a)Determine the volume V of one of the masses using the apparatus provided

Record V

for hore

V=.....cm³

(2 marks)

Explain how you determined the volume V

(2 marks)

(b)(i) Determine the centre of gravity of the metre rule and record it

G=..... cm mark

(1 mark)

(ii)Arrange the apparatus as shown in the diagram below such that X=5cm from the pivot. With the 100g mass completely immersed in water, hang the other 100g mass on the meter rule and adjust its position until the system is in equilibrium as shown in the diagram.



Repeat the procedure above with the following values of X and fill the table

NB. During each experiment ensure that the position of the pivot does not change

X(cm)	5	10	15	20	25	30
Y(cm)						

(2 marks

(c) Plot a graph of Y against X

(4 marks)

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	(d) Determine the slope 'S' of the graph	(2 marks)
	Jisit w	
	st papers	
	(c) Given that $S = \frac{f}{w}$	
St. Le		
FORMORE	Where f is the apparent weight of the mass in the liquid L and w is the a mass, calculate the value	actual
	f=	. (1 mark)
		(1
	U=	(I mark)

(f)Hence determine the density p of liquid L (2marks)

QUESTION TWO: PART A

exceepastpapers.com You are provided with the following apparatus;

- A voltmeter •
- An ammeter
- A Resistor wire mounted on a mm scale(AB)
- A switch

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- Two dry cells and cells holder.
- Six pieces of connecting wires
- Micrometer screw gauge (shared)

Set up the apparatus as in the circuit diagram below; fig2.0



PROCEED AS FOLLOWS;

a) With the switch closed and the length (L=AB) of the resistor wire AB adjusted to 100.0 cm, record the Voltmeter reading (V) and the Ammeter reading (I)



(1mk)

- Hence calculate R given $by R_0 = V_0$ St the Voltmet b) Adjust the Voltmeter reading to obtain values given in the Table of Results below by varying the length (L) of the Resistor wire. Read and record the corresponding Ammeter Readings given in the Table 2.0 below.
- c) Complete filling the table 2.0 below.

(5mks)

	c) Complete filling the table 2.0 below.					(5mks)		
NOTE STE	V (volts)	1.0	1.2	1.4	1.6	1.8	1.9	
\$ ^{°°}	I(A)							
	$R = \frac{V}{I}_{(Ohms)}$							
	<u>1</u> (A ⁻¹)							

d) Plot the graph of $\underline{\mathbf{1}}_{(\mathbf{A}^{-1})}$ against **R** (Ohms). (5mks) e) Determine the slope of the graph. (2mks)

- f) From the graph determine the e.m.f (E) of the battery, given that E=V+Ir. (2mks)
- g) From the graph determine the value of r. (1mk)

PART B

ART B (i) Using the micrometer screw gauge, measure the diameter of the resistor wire AB.

d= 💦 mm ACSE Past Pat Radius= (1mk) m $e^{\frac{4}{F^{ce}}}$ (ii)Determine the value of α , given by e^{α}

 $\alpha = AR_0$ -where A is cross-sectional area of the resistor wire AB in m² And L is the length of the wire AB=1m. (2mks)