

v). Determine the slope of the graph at V=1 volt. (2marks)

vi) What physical quantity is represented by the slope of the graph at any given point? (1 mark)

b. (i). Given the apparatus in a (i) above, draw a diagram of the circuit you would use to determine the current through the resistant wire and the potential difference across. (1 mark)

ii) Set up the circuit you have drawn. Record the ammeter reading 1 and the wire reading v when l=100cm
V=
l=

iii) Using a micrometer screw gauge, measure the diameter of the wire. (1 mark)

d= m

iv) Calculate the quantity:

$$p = 0.785 \frac{(v)}{(1)} \frac{d^2}{L}$$
 and give its units, where L is one meter. (2mrks)

NAME..... .INDEX NO.
SCHOOL SIGNATURE
DATE

231/3
PHYSICS
PRACTICAL
March / April 2015
2 ½ Hours

NAROK SOUTH DISTRICT SECONDARY SCHOOLS JOINT EXAMINATION
Kenya Certificate of Secondary Education (K.C.S.E)
PHYSICS
Paper 3
2 ½ Hours

INSTRUCTIONS TO CANDIDATES:

1. Write your **name** and **Index Number** in the spaces provided above.
2. Sign and write the **date of examination** in the spaces provided above.
3. Answer **all** questions in the spaces provided in this paper.
4. You are supposed to spend the first **15 minutes** of the 2 ½ hours allowed for this paper reading the whole paper carefully before commencing the work.
5. Marks will be given for clear record of the observations actually made, for their suitability and accuracy, and the use made of them.
6. Candidates are advised to record their observations as soon as they are made.
7. **Non programmable silent calculators** and **KNEC** mathematical tables may be used.

For Examiners use only

	MAXIMUM SCORE	CANDIDATES' SCORE
QUESTION ONE	23	
QUESTION TWO	17	
TOTAL	40	

This paper consists of 8 printed pages.
Candidates are advised to check and make sure all pages are printed.

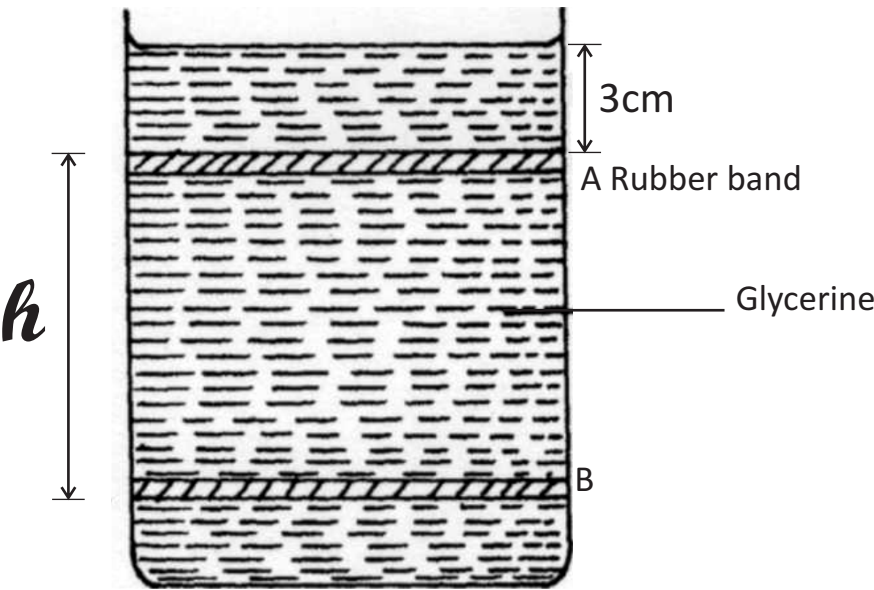
QUESTION 1

You are provided with the following

- A measuring cylinder
- Glycerine
- Two rubber bands
- One metre ruler
- Steel ball bearing
- A magnet
- A micrometer screw gauge
- A stop watch

Proceed as follows.

- a) Measure the diameter D of the steel ball using the micrometer screw gauge.
 $D = \dots\dots\dots\text{mm}$ (1mk)
 $D = \dots\dots\dots\text{m}$ (1mk)
- b) Take a measuring cylinder and fill it with glycerine. Fix the bands A and B such that band A is 3 cm from the surface of glycerine as shown in the fig. 2 below.



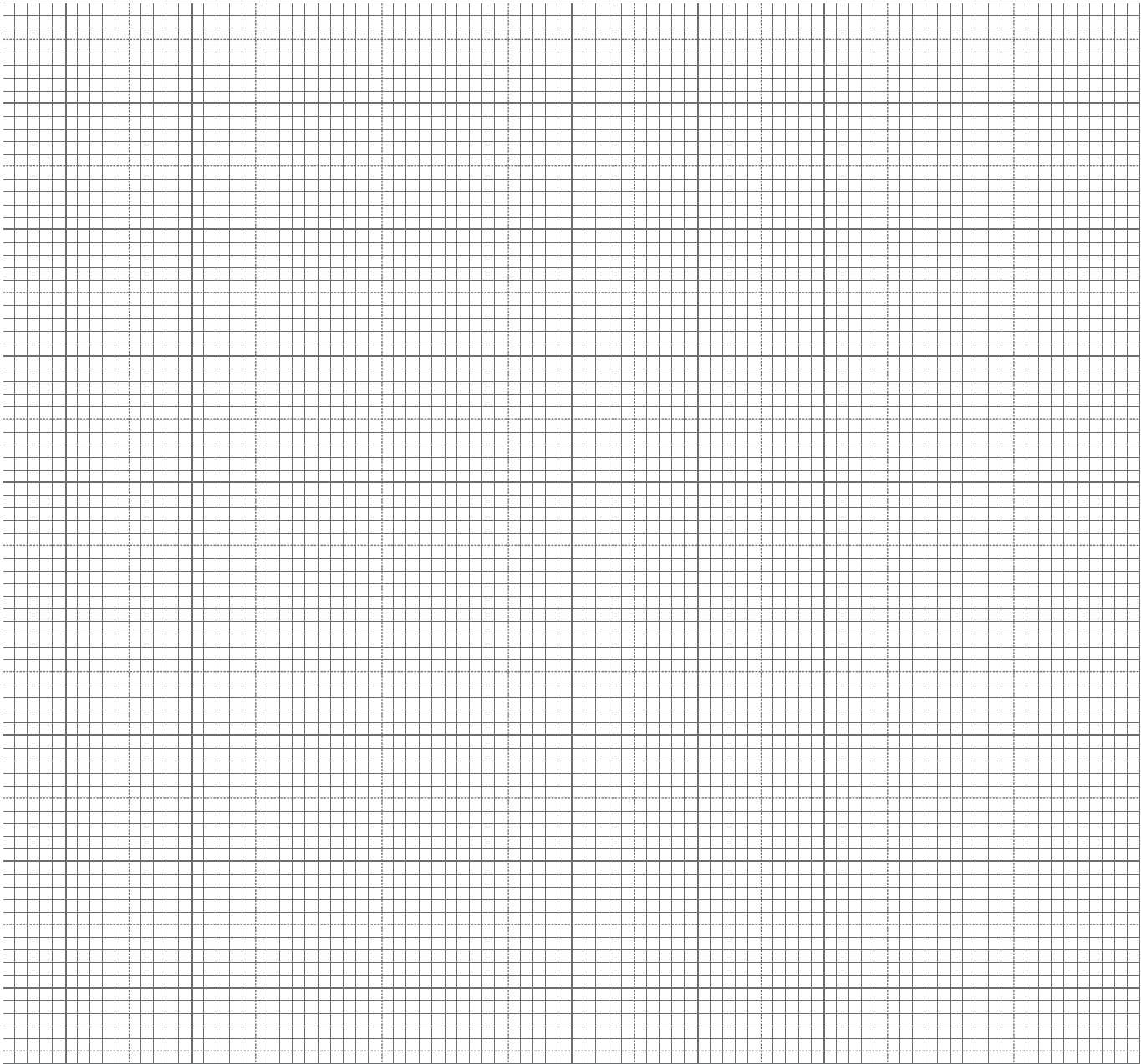
- c) Adjust the lower rubber band B so that $h = 35\text{cm}$.
d) Release the steel ball from the surface of the liquid and obtain the time, t it takes to travel the distance $h = 35\text{cm}$. Record this value in the table 2 shown below.
e) Use the magnet provided to remove the steel ball from the liquid,
f) Repeat procedures (b), (c) and (d) for values of h given in the table below.

- ii) With the crocodile clip at P, take the voltmeter reading and ammeter reading. Record V and repeat the readings for $L=80, 60, 40, 20$ and 0cm respectively and complete the table below.

Length, $L(\text{cm})$	100	80	60	40	20	0
Voltage, $V(\text{V})$						
Current, $I(\text{A})$						

- iii). What changes do you observe on the bulb as L decreases from p ? (1m

- iv). Plot a graph of ammeter reading (y -axis) against voltmeter readings. (5m



b) Calculate the value of

$$\eta = \frac{\cos\left(90^\circ - \left\{\frac{A + D}{2}\right\}\right)}{\sin \frac{A}{2}}$$

(2 marks)

c) What is the significance of \square ?

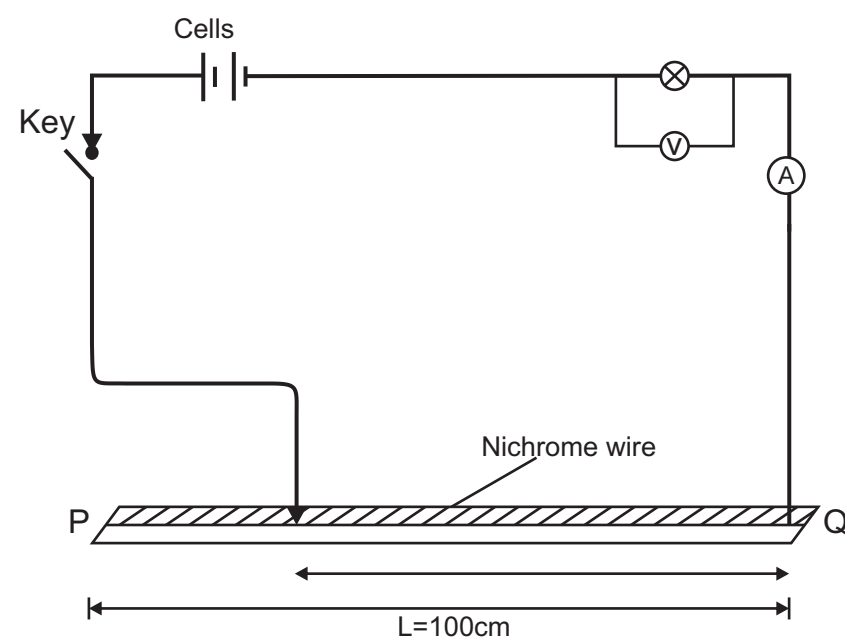
(1 mark)

QUESTION 2B 20MKS)

You are provided with the following

- Two dry cell -One bulb
- Voltmeter (0~3v or 0-5v) -Ammeter (0-2.5A)
- Amounted nicrome wire mounted on a millimeter scale
- Switch
- Seven connecting wire at least two with crocodile clips
- Micrometer screw gauge Proceed as follows:

a) i) Set up the circuit as shown in the figure below.



g) Record the values in the table below.

h (cm)	35	30	25	20	15	10
t(s)						

b) i) Plot the graph of t (vertica axis) against h.

(5 marks)

ii) Determine the slope S of your graph (3mks)

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iii) The equation of the graph is given by

$$K = \frac{D^2 g(t) (a-b)}{18h}$$

Determine the value of K given that

$g = 10\text{m/s}^2$

$a = 7.0 \times 10^3 \text{kg/m}^3$

$b = 1.26 \times 10^3 \text{kg/m}^3$

(3mks)

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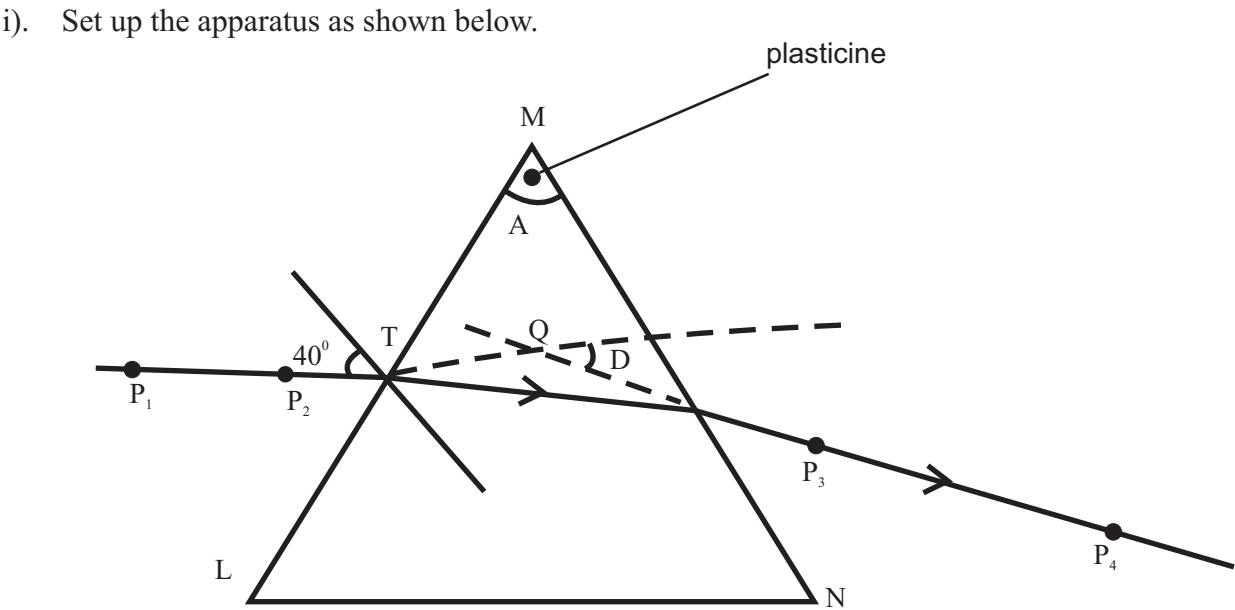
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QUESTION 2 A

You are provided with the following apparatus:

- Prism
- 4 optical pins
- plain paper
- Protractor
- Some plasticine
- Soft board



ii) Measure angle A of the prism using a protractor (1 marrk)

iii) Place the prism on a plain paper and trace its outline with a pencil. Attach some plasticine to the prism to indicate the prism angle A, construct a normal at point T along LM. Draw an incident ray to strike the prism at 40°. Replace the prism and stick pins P₁ and P₂ to define the incident ray. View P₁ and P₂ from the opposite face (MN). Insert pins P₃ and P₄ so that they appear to be in line with images of P₁ and P₂. Remove the prism and join P₃ to P₄ to give emergent ray. Extrapolate the emergent ray into the prism so as to meet the extrapolated incident ray at Q.

iv) a) Measure angle D. (1 mark)