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Name……Index No……..

School……..Date……

Adm No……

232/3
PHYSICS
PRACTICAL
PAPER 3

INSTRUCTIONS TO THE CANDIDATES:

1. Write your name and Index Number and Adm No. in the spaces provided above.
2. Sign and write the date of examination in the spaces provided above
3. Answer all the questions in the spaces provided in the question 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.
5. Marks are given for a clear record of the observation actually made, their suitability, accuracy and the use of them.
6. Candidates are advised to record their observations as soon as they are made.
7. Non –programmable silent electronic calculators and KNEC mathematical tables may be used.

FOR EXAMINERS' USE ONLY

QUESTION	TOTAL	CANDIDATES MARKS
ONE	20	
TWO	20	
TOTAL	40	

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QUESTION ONE

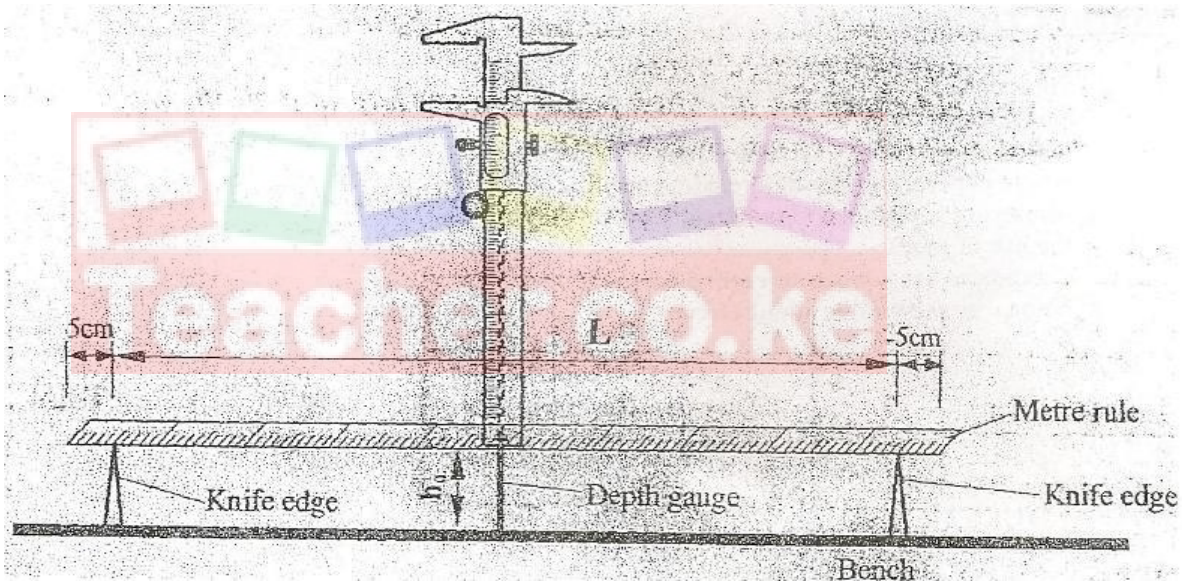
You are provided with the following:

- A metre rule
- Vernier calipers
- A 300g mass
- Two knife edges
- Some thread

Proceed as follows:

a) Place the metre rule on the knife edge such that each knife edge is 45cm from the 50cm mark (centre of the rule). See the figure. Ensure that the millimeter scale of the metre rule is facing upwards. The distance L between the knife edges is now 900mm.
Place the vernier calipers vertically against the metre rule at the 50cm mark with the depth gauge lowered to touch the inch as shown in the figure below.
Record the height h_0, of the upper edge of the metre rule at the 50cm mark.

$h_0 = 102 \pm 3mm$ (1 mark)



b) Using the thread provided, hang the 300g mass at the 50cm mark of the metre rule. Ensure that the mass does not touch the bench. Measure and record in table, the height h of the edge of the metre rule at the 50cm mark.

c) With the 300g mass still at the 50cm mark, adjust the position of the knife edges so that L is now 800cm. (The knife edges should be equidistant form the centre of the metre rule). Measure and record in the table provided the height h of the edge of the metre rule at the 50cm mark.

d) Repeat the procedure in (c) for other values of L shown in table 1. Complete the table.

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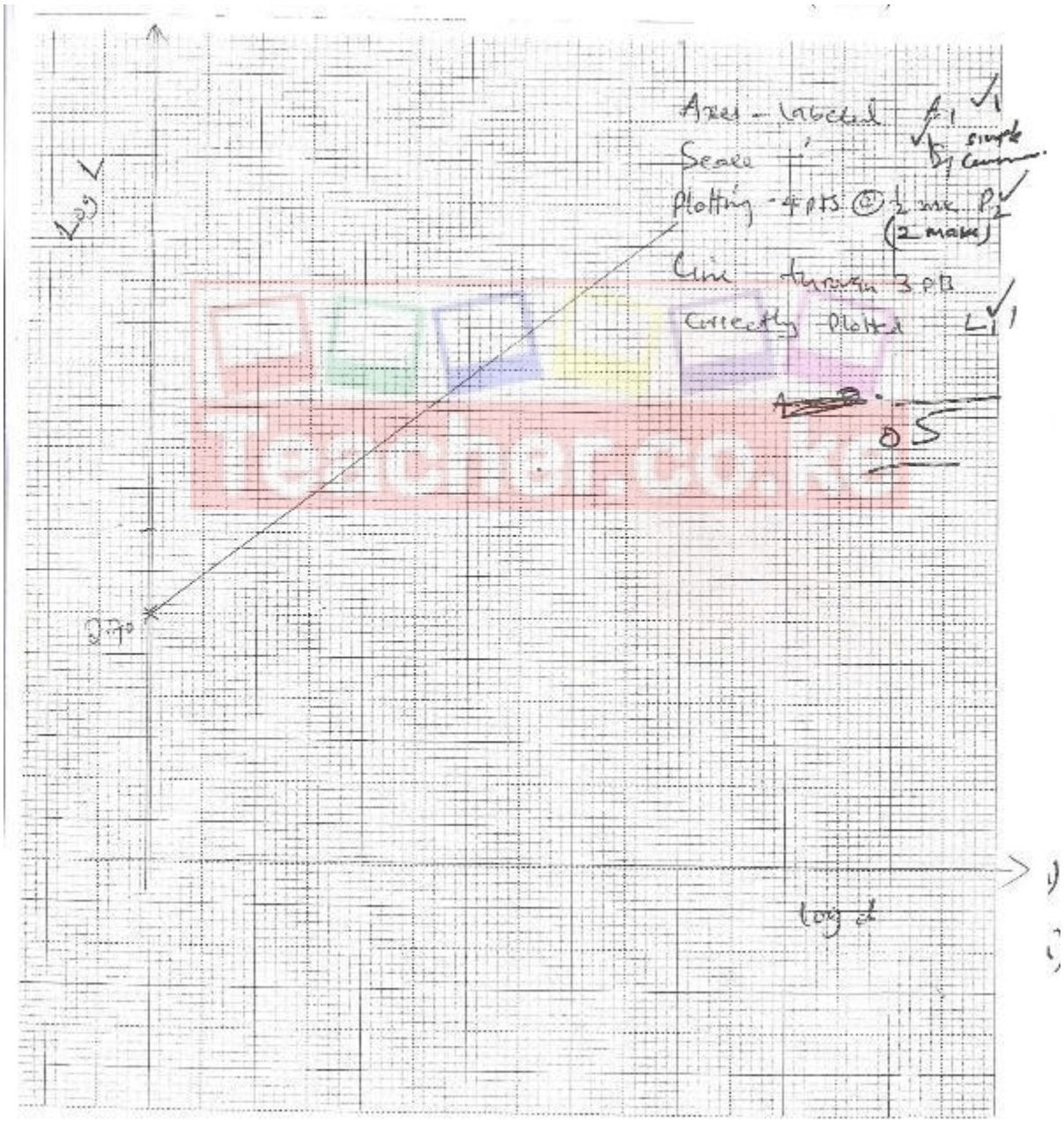
Length L (mm)	900	800	700	600	500
Height h (mm)	57.10	72.0	86.0	98.0	10
Depression d (h0-h)mm	45	30	16	4	1
Log L	2.95	2.90	2.85	2.78	2.701
Log d	1.65	1.48	1.20	0.60	0

(7 marks)

c) Plot a graph of Log L (Y-axis) against log d. (5 marks)



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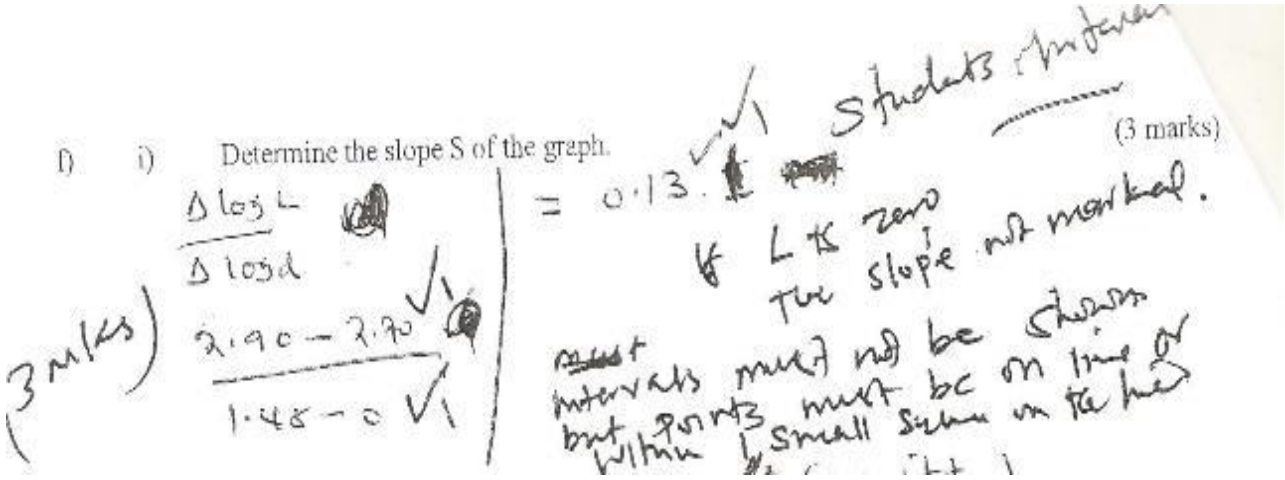
f) i) Determine the slope S of the graph. (3 marks)



ii) Evaluate y = 1/S *1/013*

y = *7.69* (1 mark)

iii) Determine G, the value of log L, when log d = 0 (2 marks)

G = 2.70 ± 0.2

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SECTION TWO

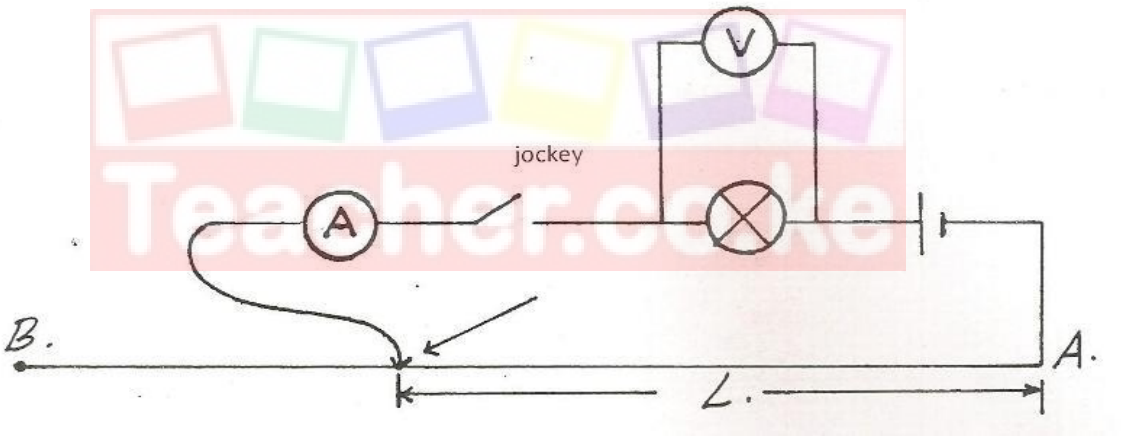
PART 1

You are provided with the following

- A nicrome wire 1m long mounted on a scale
- 2 dry cells
- 1 ammeter (0 – 1A)
- A switch
- A bulb
- A voltmeter (0-5v)
- A one cell holder
- At least 6 connecting wires, one with a jockey

Proceed as follows

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



(ii) With the jockey/crocodile clip at B (L=100cm) note the voltmeter reading V and ammeter reading, I and record ont eh table below.

(iii) Repeat the procedure in (ii) above for L=80cm, 60cm, 40cm, 20cm and 0cm and record.

enght (cm)	100	80	60	40	20	0
Volts (volts)	0.9	1.0	1.1	1.5	1.9	2.3
Currnet I (A)	0.10	0.12	0.14	0.16	0.18	0.20

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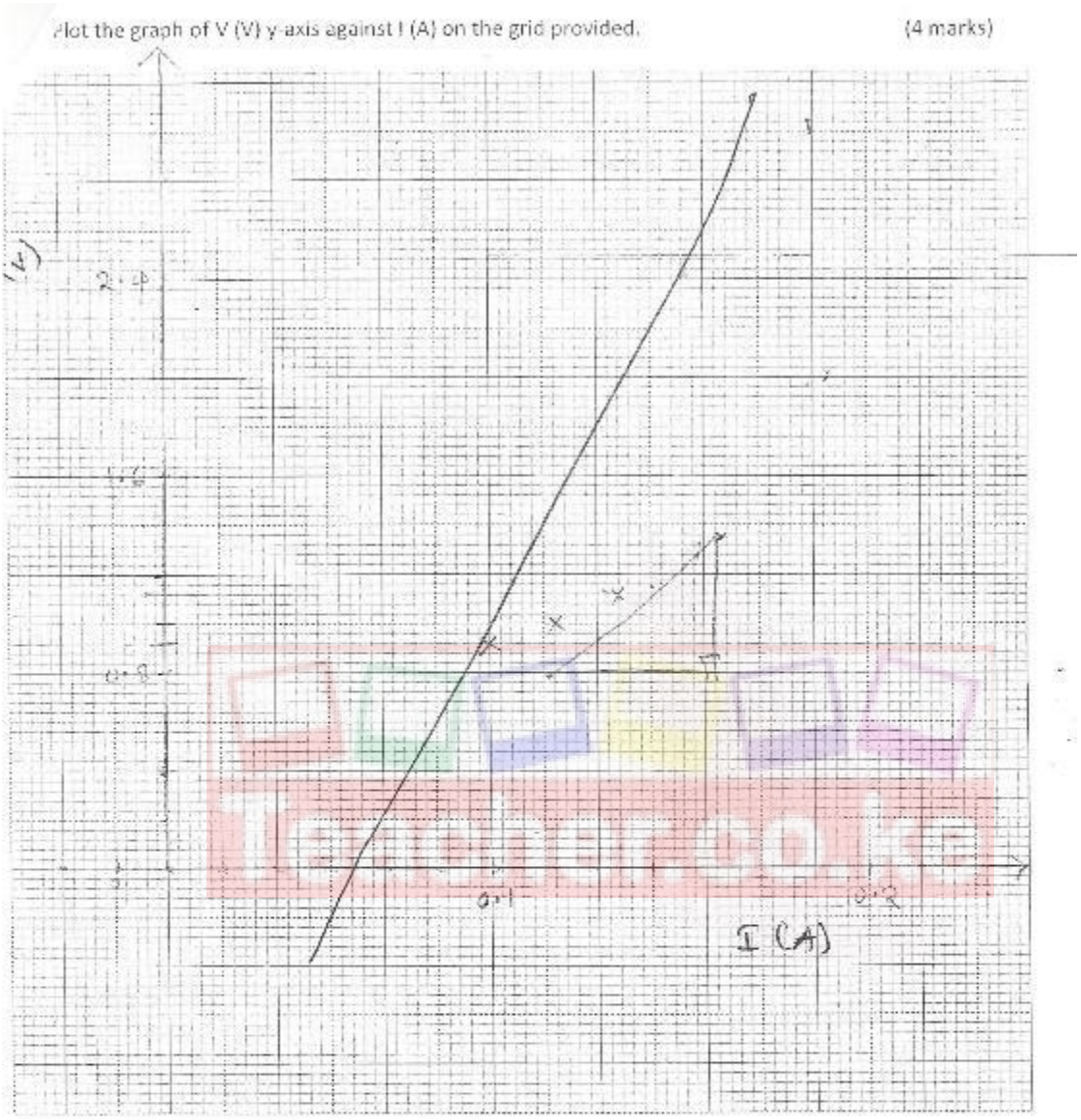
(v) Plot the graph of V (V) y-axis against I (A) on the grid provided. (4 marks)



v) Calculate the slope of your graph when current is 0.15A. (3mks)

Instantaneous slope

$\frac{\Delta V}{\Delta I}$

Correct interval ½

Correct evaluation ½ with units

Must be from the graph ½ without units (Ω or V/A)

Wrong Curve — Slope is zero. (3)

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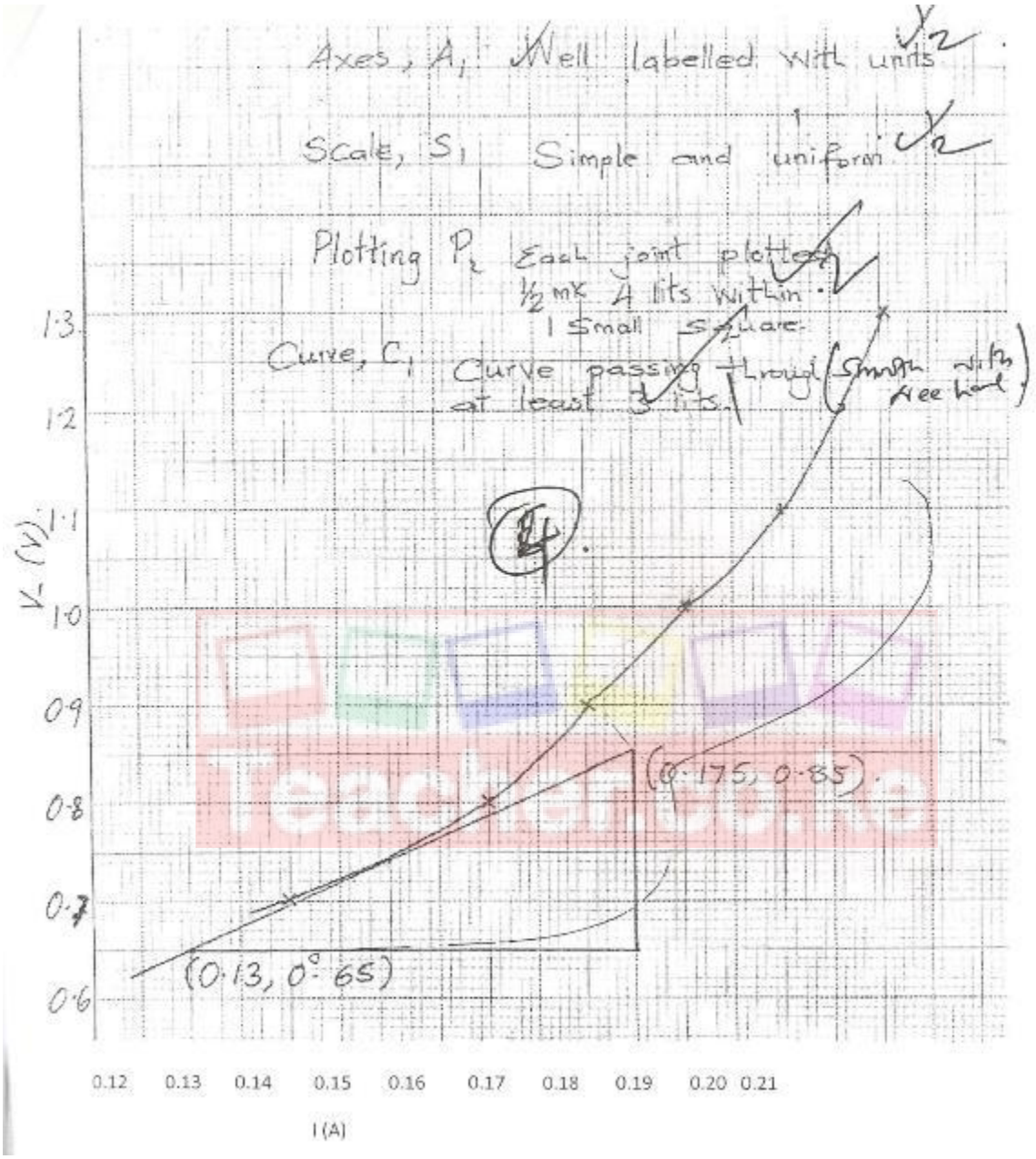

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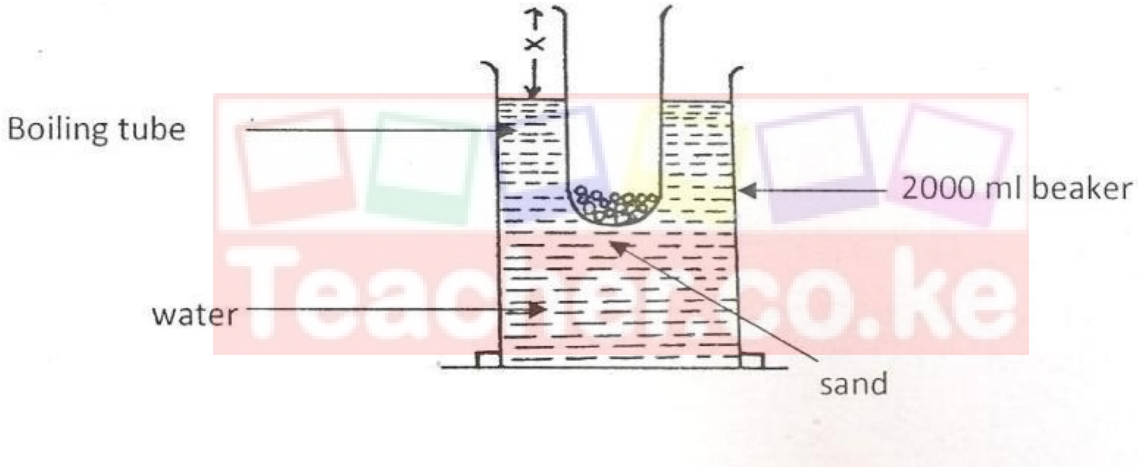
PART II

You are provided with the following

- Boiling tube
- 2000ml beaker
- Sand in a small beaker
- Vernier calipers (to be shared)
- A weighing balance (to be shared)
- Meter rule / a half meter rule /30cm rule / 15cm rule
- Spatula and water

Proceed as follows

a) Set up the apparatus as shown in the figure below by adding sand into the boiling tube until the boiling tube just floats upright.



b) Measure the length, X (1 mark)
X = *2.6± 0.2cm*

c) Measure the whole length of test tube y (1 mark)
Y = *14.90 ± 0.2*cm

d) Determine the external diameter of the test tube using the vernier caliper.
External diameter =*2.40* ±0.2cm (1 mark)
External radius, r = *1.20± 0.1*cm (1mark)

e) Measure the mass of the test-tube and its contents,
Mass, M =*59.2 ± 5*g (1 mark)

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f) Determine the density of water given that

$$\rho = \frac{7M}{22r^2(y-x)}$$

$= \underline{7\ (59.2)}$
$22\ (1.22)\ (14.9 - 2.60)$

$= \underline{414.4}$
97.416

$= 1.06gm$

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