

**KENYA HIGH SCHOOL MOCK 2020
PHYSICS PAPER 3**

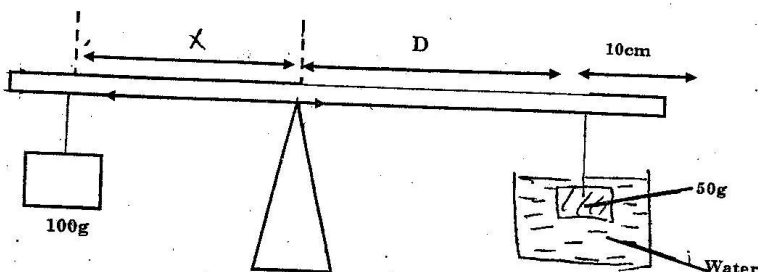
PART A

You are provided with the following metre rule

- A knife edge raised 20cm above bench
- One 50g mass and one 100g mass
- Some thread
- Some water in a beaker
- Tissue paper

Proceed as follows

- (a) Balance the metre rule on the knife edge and record the reading at this point
Balance point = cm (1 mark)
For the rest of this experiment the knife edge must be placed at this position.
- (b) Set up the apparatus as shown below .use 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 direction X and D are measured from the knife edge and the 50g mass is fully submerged in the water
Record the value of X and D

X.....(1 mark)

D.....(1 mark)

Apply the principle of moments to determine the weight W_1 of the 50g mass in water and hence determine the upthrust U_w in water

W_1(2 marks)

U_w

Remove the 50g mass from the water and dry it using tissue paper

- (c) Now balance the metre rule when the 50g mass is fully submerged in the liquid L record the value of the distance X
X = Cm.....(1 mark)

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

W_2(1 mark)

$U_L = \dots\dots\dots$ (1 mark)

- d) Determine the relative density R.D of the liquid L given that
 $R.D = \frac{U_L}{U_w}$

PART B

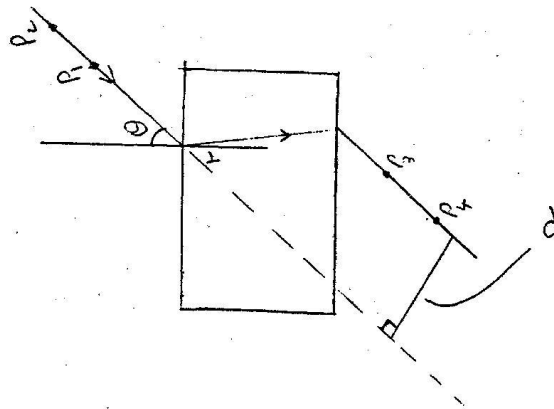
You are provided with the following

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

You are required to have your own mathematical set

Proceed as follows

- e) Place the plain sheet of paper in the soft board and fix it using the cellotape provided. Place the glass block at the centre of the sheet, Draw the outline, Remove the glass block.



- (f) Draw normal at point 2 from the end of one of the longer side of the block outline
This normal line will be used for the rest of the experiment
Draw a line at an angle $\theta = 25^\circ$ from the normal. Stick two pins P_1 and P_2 vertically on this line
- (g) 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 image of the first two pins. Draw a line through the marks made by P_3 and P_4 to touch the outline. Extend the line P_1P_2 through the outline (dotted line). Measure and record in table 2 the perpendicular distance d between the extended line and the line P_3P_4 (See figure above)

Record this value in the table below

- (h) Repeat the procedure in (f) and (g) for the values shown in the table

N/B The sheet of paper with the drawing must be handed in together with the question paper. Ensure you write your name and index number on the sheet of paper

θ (degrees)	25	35	40	45	55	60	65
d cm							

- (i) Plot a graph of d against θ (3 marks)
 (5 marks)
- (ii) Use the graph to estimate the value of d when $\theta = 0$ (2mks)

QUESTION 2

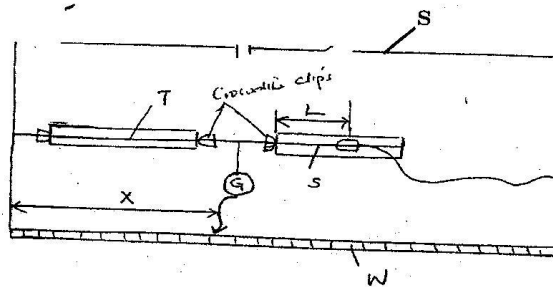
You are provided with the following two wires, one labeled T, and the other S each mounted on a piece of wood

- A wire labeled W mounted on millimeter scale
- A dry cell and cell holder
- A jockey
- A centre zero galvanometer connecting wires
- A micrometer screw gauge
- A metre rule
- A Switch

Proceed as follows

- (a) Determine the average diameter D of the wire labeled T and the average diameter of the wire labeled S using the micrometer screw gauge provided
- D = _____ mm
 d = _____ mm
 Calculate $\frac{D}{d} =$ _____ (1 mark)

- b) Set up the apparatus as shown in the circuit diagram in the figure below. Use crocodile clips to fix the length of T and S at 50cm each initially. This length of I will not be changed through the experiment



- c) Close the switch use the jockey to touch one end of the wire W and then the other

end. The deflections on the galvanometer should be in the opposite directions. If not check the circuit. Adjust the position of the jockey along the wire W until there is no deflection in the galvanometer. This is the balance point. Record the value of X in cm in the table

- d) Adjust the length of the wire S to 45cm find the balance point and record the value of X in the table repeat for the values of n in the table. Complete the table. (6mks)

- (i) Plot a graph of $\frac{1}{X}$ against L (5 marks)

L (cm)	50	45	40	35	30	25	20
X (cm)							

- (ii) Determine the slope m of the graph (3 marks)

- (iii) Determine the ratio $\frac{D}{d}$ given that $m = \frac{D^2}{5000 d^2}$ (2 mark)

PHYSICS
Paper 3 (Practical)

CONFIDENTIAL

Question 1

PART A

- Each candidate will require
- Metre rule
- A knife edge raised 20 cm above the bench
- one 50g mass and one 100g mass
- Some thread
- Some water
- Some liquid L in a beaker (paraffin)
- Tissue

- T nichrome wire SWG 28, length 55cm to be mounted on a piece of wood with cello tape
- A nichrome wire L gauge 32 mounted on millimeter scale
- A new dry cell and cell holder
- A centre zero galvanometer
- Connecting wire with crocodile clips
- Micrometer screw gauge (to be shared)
- Metre wire

PART B

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

Question 2

- Two wires are labeled T and the other S

