**MWAKICAN FORM THREE JOINT EXAMINATION**

**Name ………………………………………………………………………………ADM No………………..……………Class………**

232/3

**PHYSICS**

**Paper 3 (practical)**

**June/July 2017**

**Time: 2 1/2 Hours**

**INSTRUCTIONS TO CANDIDATES**

1. Write you name and admission number in the spaces provided.
2. Answer all question in the spaces provided.
3. All working must be clearly shown where necessary.
4. Non-programmable silent electronic calculators may be used.
5. Candidates should check the question paper to ascertain that all pages are printed as indicated and that no question is missing.

|  |  |  |
| --- | --- | --- |
| **Question** | **Candidate’s score** | **Max. Score** |
| **1** |  | **20** |
| **2** |  | **20** |
| **Total** |  | **40** |

***This paper consist of 5 printed pages***

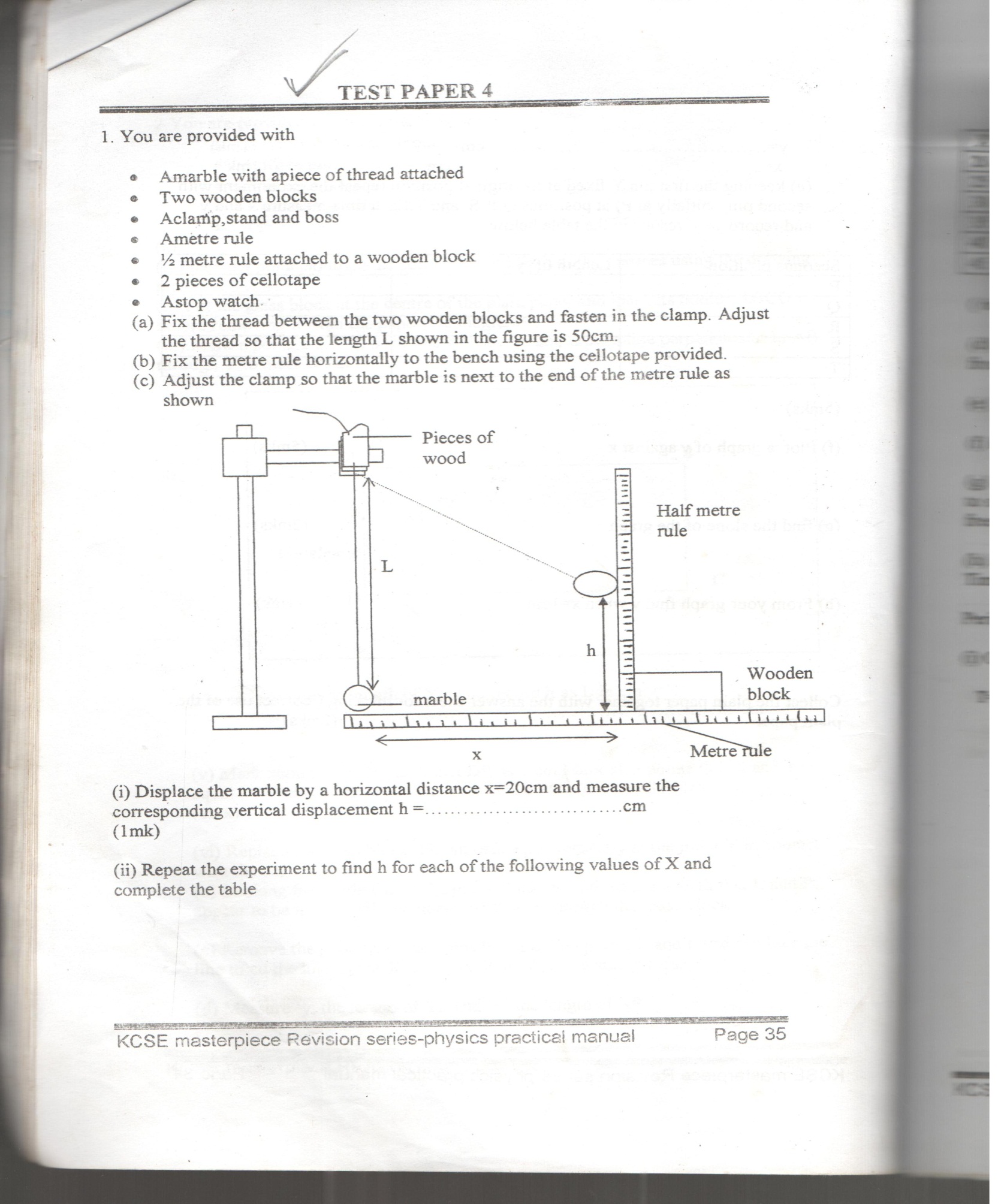
**Question one**

***You are provided with the following:***

* A pendulum bob with a 100cm piece of thread attached
* Two pieces of wood
* A clamp, stand and boss
* A metre rule
* ½ metre rule attached to a wooden block
* 2 pieces of cellotape.
* A stop watch.

***Proceed as follows***

1. Fix the thread between the two pieces of wood and fasten in the clamp. The thread should be such that the length L as shown in the figure is 50 cm.
2. Fix the metre rule horizontally to the bench using the cellotape provided.
3. Adjust the clamp so that the pendulum bob is next to the end of the metre rule as shown below.



1. Displace the bob by a horizontal distance x=20cm and measure the corresponding vertical displacement ,h=………………..cm (1mk)

Repeat the experiment to find h for each of the following vales of X and complete the table. (5mks)

|  |  |  |  |
| --- | --- | --- | --- |
| X (cm) | h (cm) | X2 (cm2) | X2/h (cm) |
| 20 |  |  |  |
| 25 |  |  |  |
| 30 |  |  |  |
| 35 |  |  |  |
| 40 |  |  |  |
| 45 |  |  |  |

1. Plot a graph of x2/h against h starting the x2/h axis from 50cm and h axis scale from zero. (5mks)
2. Determine the slope of the graph. (3mks)
3. From the graph find the value of X2/h when h=0 (1mk)
4. Raise the clamp slightly without changing the length L so that the bob is free to swing. Displace the bob through a horizontal distance of about 10cm and let free to swing.
5. Determine the

Time for 20 oscillations=…………………………………………………………… (1mk)

And hence Periodic time T=……………………………………………… (1mk)

Calculate the value of p from the following equation. (3mks)

T=2π P

g where g=10m/s2

**Question Two**

***You are provided with the following:***

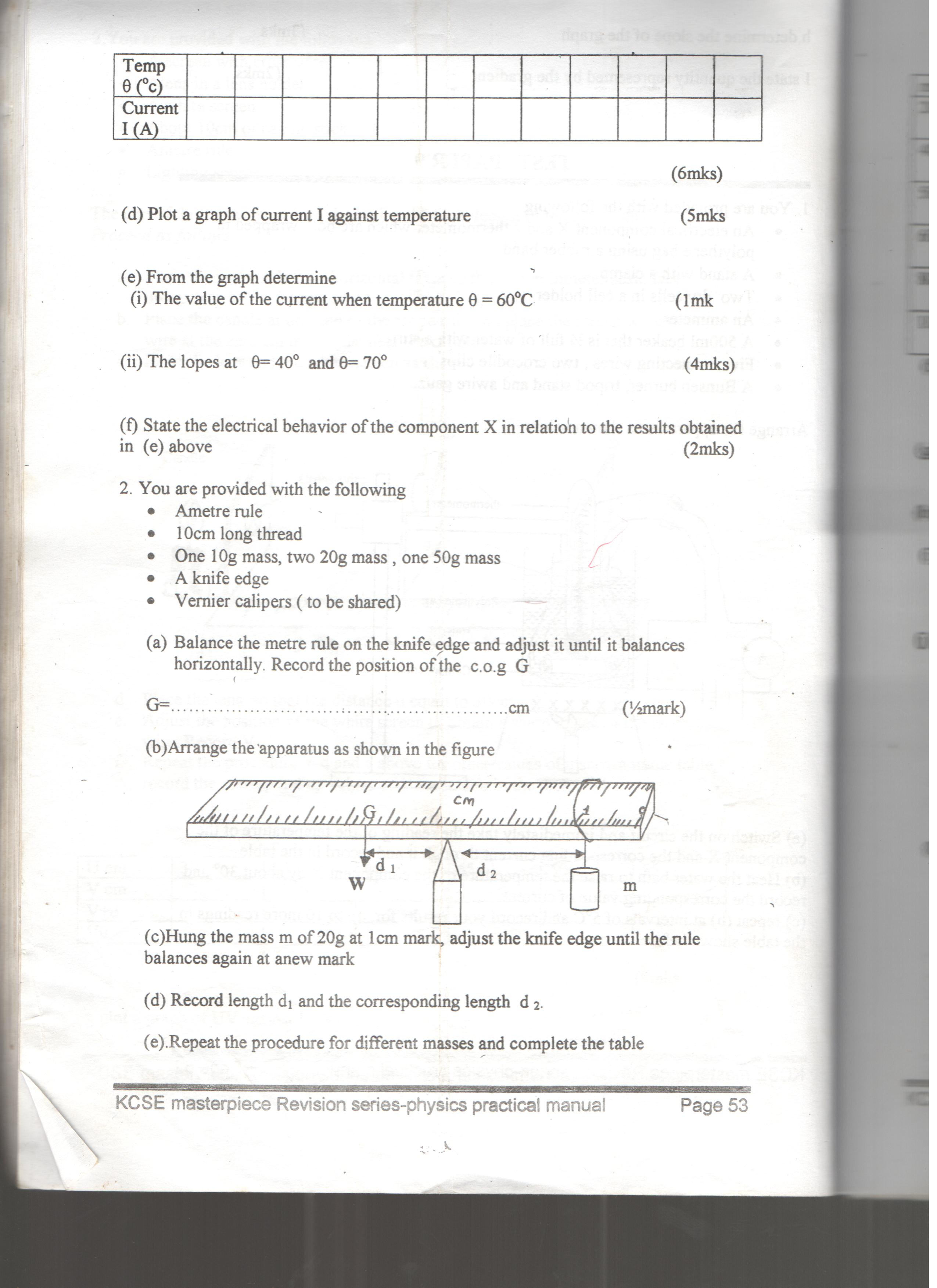
* A metre rule
* 20cm long thread
* One 10g mass, two 20g mass, one 50g mass
* A knife edge
* Vernier calipers (to be shared)

***Proceed as follows***

1. Balance the metre rule on the knife edge and adjust it until it balances horizontally. Record the position of the c.o.g (G)

G=……………………………………..cm (1mk)

1. Arrange the apparatus as shown in the figure below



1. Hung the mass m of 20g at 1cm, a point from the end, adjust the knife edge until the rule balances again at a new mark.
2. Record length d1 and the corresponding length d2.
3. Repeat the procedure for different masses while suspending the masses at the same point and complete the table. (6mks)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| m (g) | d1 (cm) | d2 (cm) | d1/d2 | md2 |
| 20 |  |  |  |  |
| 40 |  |  |  |  |
| 50 |  |  |  |  |
| 60 |  |  |  |  |
| 80 |  |  |  |  |
| 100 |  |  |  |  |

1. Plot a graph of md2 against d1 (5mks)

1. Find the slope S of the graph (2mks)

1. Use the graph to find weight W of rule g=10N/kg (1mk)
2. Use the vernier calipers to measure the thickness t and width b of the metre rule

t=…………………………………………………….cm (1/2mk)

b=……………………………………………………cm (1/2mk)

1. Determine the quantity P given that (2mks)

P= S

100cm x t x b

***This is the last printed page***