An equipment used in the laboratory to find out the Young's modulus (*Y*) of an object like a wire, is composed of two identical wires made of the same material which is attached to a rough stand. These wires hold the following. Main scale (S), vernier scale (V), a still weight (W_0) and a balance pan.

(a) **Draw a labelled diagram of this equipment in the given space.**

(b) **What is the necessity of this equipment to have two wires?**

(i) ----------

(ii) ----------

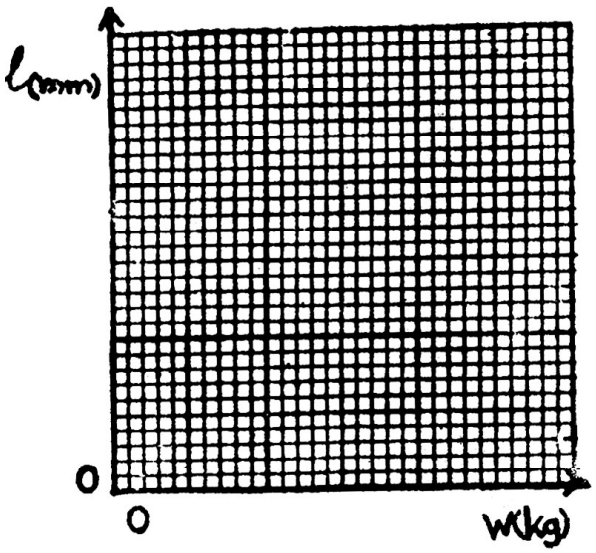
(c) **In this experiment readings are taken by adding the weight and removing the weight. State the reasons for that.**

(i) ----------

(ii) ----------

(d) **A student has obtained the following measurements in this experiment**

Weight (kg)	Mean value of the reading when inserting and removing the weight (cm)
1.0	1.236
1.5	1.246
2.0	1.256
2.5	1.266
3.0	1.276



(i) **Plot a graph on the total weight (W) vs increase in length of the wire (*l*)using the readings given in the chart and find its gradient (m).**

m = ----------

(ii) **What are the other measurements you need to find the y of this matter? State the measuring equipment needed to obtain those.**

	Measurement		Equipment
(a)	----------	(take as α)	----------
(b)	----------	(take as β)	----------

(iii) **To obtain one of the above mentioned readings, a certain procedure should be followed. State that procedure.**

(iv) **Obtain an expression for the Young's modulus (*Y*) of the material used in this experiment using the gradient of the graph (m) , α and β.**

Y = ----------

(e) **Young's modulus of steel is approximately twice of Young's modulus of Aluminium. Draw the rough sketch of the curves for the stress (S) and strain (E) for steel and Aluminium in the given diagram.**