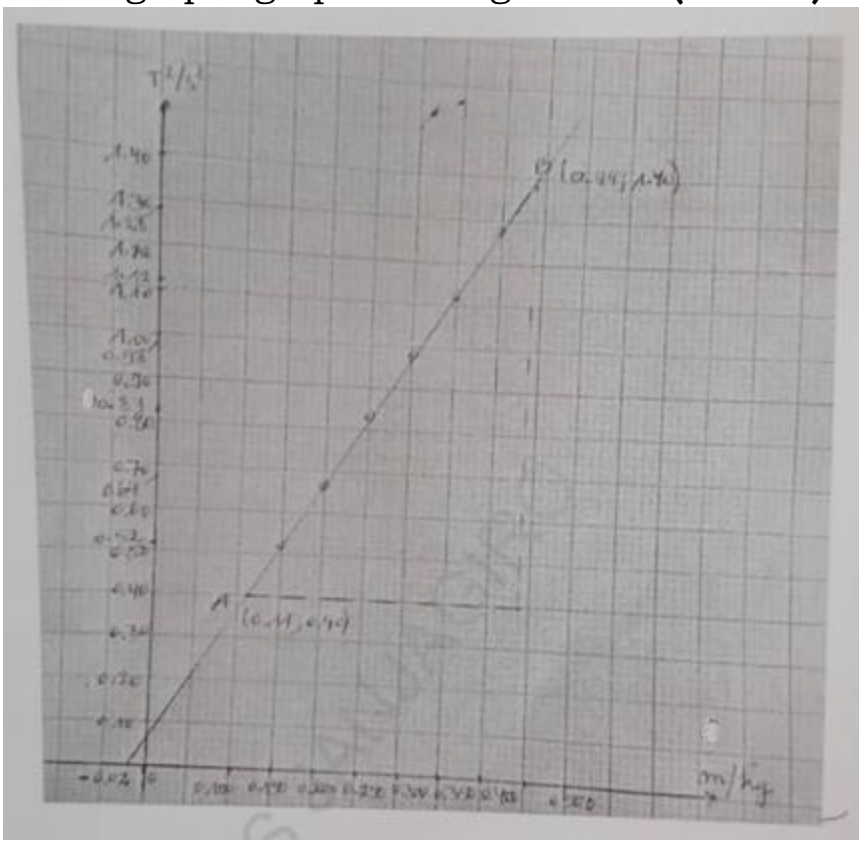
MARKING GUIDE OF S5 ALTERNATIVE TO PHYSICS PRACTICAL

a) Table

Load m/kg	Average t/s	Period T/s	T^2/s^2
0.150	7.16 **(0.5 marks)**	0.72**(0.5 marks)**	0.52**(0.5 marks)**
0.200	8.18**(0.5 marks)**	0.82**(0.5 marks)**	0.67**(0.5 marks)**
0.250	9.10**(0.5 marks)**	0.91**(0.5 marks)**	0.83**(0.5 marks)**
0.300	9.93**(0.5 marks)**	0.99**(0.5 marks)**	0.98**(0.5 marks)**
0.350	10.58**(0.5 marks)**	1.06**(0.5 marks)**	1.12**(0.5 marks)**
0.400	11.27**(0.5 marks)**	1.13**(0.5 marks)**	1.28**(0.5 marks)**

b) Title of the graph: graph of T^2 against m. **(1mark)**



Two labelled axes **(0.5 marks x 2 = 1mark)**
Two uniform scales **(0.5 marks x 2 = 1mark)**
Six plotted points **(0.5 marks x 6 = 3marks)**
Line of best fit **(1mark)**
Indication of the slope **(1mark)**

c) Slope S is given by: $s = \frac{\Delta T^2}{\Delta m} = \frac{1.40-0.40}{0.440-0.110} = 3.030\ s^2/kg$ **(1mark)**

d) i. The spring constant is given by: $S = \frac{4\pi^2}{k}$

$$k = \frac{4\pi^2}{3.030} = 13.02\ N/m$$ **(1mark)**

ii. effective mass of the spring system m_0 is obtained when m=0, Y-intercept T^2=0.06 s^2.

From $T^2 = \frac{4\pi^2}{k}m + \frac{4\pi^2}{k}m_0$

$$T^2 = \frac{4\pi^2}{k}m_0$$

$$m_0 = \frac{0.06x13.02}{4x3.14^2} = 0.02kg$$ **(1mark)**