Using the graphs you have produced determine the following parameters: Young's modulus, yield stress, tensile strength and percentage elongation. You may wish to annotate the graphs to show how your values were determined - 6 marks

Extension (mm)	Force (KN)	Stress Pa	Strain No unit.
0	0	0	0
0.55	1	[illegible]	0.043
0.75	2	2.52×10^{8}	0.058
0.85	3	3.78×10^{8}	0.066
1.00	4	5.04×10^{8}	0.078
1.25	6	7.56×10^{8}	0.097
1.5 (Max)	7.1	8.94×10^{8}	0.116

$7.94 \times 10^{-6}\ m^2$

1×10^{-6}

Area = 7.94 mm^2

Original length = 12.9 mm

By comparing with values given in any materials book make comments on the accuracy of the tensile test method for determining these parameters. What errors may have arisen during your experiment? 4 marks

Stress = Force / Area

Strain = Extension / original length

Exercise 2: THE ELASTIC BENDING OF A CANTILEVER BEAM

A. They are two beams to be tested, (narrow width and a square with similar cross section). Measure the width and thickness THREE times using the digital Vernier.
B. Position the hanger 500mm (0.5 m) from the fixed end and place the digital indicator above or below, then zero the scale.
C. Add weights in the increments shown and record the values. Then remove the loads in similar manner recording these.
D. Mean the results.
E. Repeat with the other beam.

Beam dimensions: mm

Beam dimensions mm	Thickness mm	Width mm	Thickness Square	
500	4.76	25.39	11.23	1
500	4.75	25.31	11.27	2
500	4.74	25.35	11.29	3

Load N	Deflection ↓ mm	Deflection ↑ mm	Mean mm	Load N	Deflection ↓ mm	Deflection ↑ mm	Mean mm
0	0	0.01	0.005	0	0	0	0
5	0.85	0.85	0.85	2	1.81	1.92	1.865
10	1.72	1.74	1.73	4	3.63	3.85	3.74
15	2.60	2.61	2.605	6	5.58	5.57	5.575
20	3.46	3.46	3.46	8	7.31	7.40	7.355
				10	9.11	9.21	9.16
				12	9.48	9.48	9.48

To find mean

$\frac{\text{DEF}\uparrow + \text{Def}\downarrow}{2}$