

6) Young's modulus of steel = $\frac{\frac{\Delta N}{A}}{\frac{\Delta l}{L}}$ where ΔN = change in load

now when graph is a straight line initially
for $\Delta l = 0.9 \text{ mm}$ $\Delta N = 4340$

$$\therefore Y = \frac{\frac{4340}{1.764 \times 10^{-5}}}{\frac{0.9}{18}} = \frac{3.04 \times 10^9}{4.8 \times 10^9} = 3.04 \text{ GPa} \quad 4.8 \text{ GPa}$$

Similarly for Aluminium

$$Y = \frac{\frac{2420}{1.8 \times 10^{-5}}}{\frac{0.8}{18}} = 3.04 \times 10^9 = 3.04 \text{ GPa}$$

There is a large error in actual value and measured value of young's modulus.

The error may be due to some machine error or wrong measurement of gauge length or cross sectional area