4 Fig. 4.1 shows the values obtained in an experiment to determine the Young modulus *E* of a metal in the form of a wire.

quantity	value	instrument
diameter *d*	0.48 mm	
length *l*	1.768 m	
load *F*	5.0 N to 30.0 N in 5.0 N steps	
extension *e*	0.25 mm to 1.50 mm	

Fig. 4.1

(a) (i) Complete Fig. 4.1 with the name of an instrument that could be used to measure each of the quantities. [3]

(ii) Explain why a series of values of *F*, each with corresponding extension *e*, are measured.

.....

.....[1]

(b) Explain how a series of readings of the quantities given in Fig. 4.1 is used to determine the Young modulus of the metal. A numerical answer for *E* is not required.

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.....[2]