5 A student uses a circuit containing an ammeter, a voltmeter and a cell to take measurements to determine the resistance of a length of nichrome wire.

(a) (i) Define resistance.

.....

..... [1]

(b) The student also measures the length and the diameter of the wire. Table 5.1 shows the measurements recorded for each quantity.

Table 5.1

quantity	measurement
length	(0.864 ± 0.001) m
diameter	(0.496 ± 0.002) mm
voltmeter reading	(1.38 ± 0.02) V
ammeter reading	(0.276 ± 0.001) A

(i) Show that the resistance of the wire is 5.00 Ω.

[1]

(ii) Calculate, to three significant figures, the resistivity ρ of the nichrome.

ρ = ... Ω m [3]

(iii) Calculate the percentage uncertainty in ρ.

percentage uncertainty = ... % [2]

(iv) Determine the absolute uncertainty in ρ.

absolute uncertainty = ... Ω m [1]

[Total: 10]