1 The speed v of a transverse wave on a uniform string is given by the expression

$$v = \sqrt{\frac{Tl}{m}}$$

where T is the tension of the string, l is its length and m is its mass.

An experiment is conducted to determine the speed v of the wave. The measurements are shown in Table 1.1.

Table 1.1

quantity	measurement	uncertainty
T	1.8 N	0.1 N
l	126 cm	2 cm
m	5.1 g	0.2 g

(a) (i) Using the data in Table 1.1, determine the percentage uncertainty in the calculation of the speed v of the transverse wave.

percentage uncertainty = …… % [2]

(ii) Using your answer in **(a)(i)** and the data in Table 1.1, determine the value of v, with its absolute uncertainty, to an appropriate number of significant figures.

v = ... ± ..... m s^{-1} [2]

(b) Another student used a different set-up to determine the value of v. His values of v are as follows:

20.6 m s^{-1}, 21.1 m s^{-1}, 20.4 m s^{-1}

(i) With reference to the value of v obtained in **(a)(ii)**, comment on the accuracy of the values of v that the second student obtained.

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……..…… [1]

(ii) State the type of error that is present in the measurements obtained by the second student.

Suggest a possible way to minimise or eliminate the error.

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