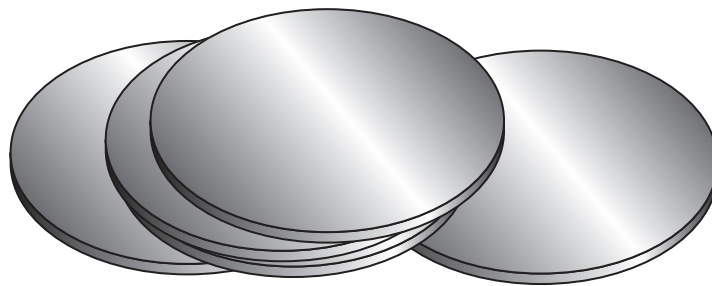**3** A student is investigating the properties of steel. He has fifty steel discs available.

Each disc has a diameter $d \approx 1.3$ cm and a thickness $t \approx 2$ mm.

(a) State a suitable measuring instrument that could be used with a single disc to measure t.

(1)

....

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(b) A balance which can measure mass with a resolution of 0.2 g is available.

Determine the minimum number of discs that should be placed on the balance together if the percentage uncertainty in the measurement of the mass is to be less than 0.5%.

(4)

density of steel = 7900 kg m^{-3}

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Minimum number of discs = ...

(c) The measured uncertainty in d is ± 0.1 mm and the measured uncertainty for t is ± 0.05 mm.

Determine the percentage uncertainty in the calculated volume of the disc.

(3)

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Percentage uncertainty in volume = ...

(Total for Question 3 = 8 marks)