Answer **all** the questions in the spaces provided.

1 Make reasonable estimates of the following quantities.

(a) mass of an apple

mass = ... kg [1]

(b) number of joules of energy in 1 kilowatt-hour

number = ... [1]

(c) wavelength of red light in a vacuum

wavelength = ... m [1]

(d) pressure due to a depth of 10 m of water

pressure = ... Pa [1]

2 A student uses a micrometer screw gauge to measure the diameter of a wire. He fails to notice that, with the gauge fully closed, the reading is not zero.

(a) State and explain whether the omission introduces a random error or a systematic error into the readings of the diameter.

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(b) Explain why the readings are precise but not accurate.

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