

- 1 (a) An electromagnetic wave has a wavelength of  $85\text{ }\mu\text{m}$ .

(i) State the wavelength, in m, of the wave.

wavelength = ..... m [1]

(ii) Calculate the frequency, in THz, of the wave.

frequency = ..... THz [2]

(iii) State the name of the region of the electromagnetic spectrum that contains this wave.

..... [1]

- (b) The current  $I$  in a coil of wire produces a magnetic field. The energy  $E$  stored in the magnetic field is given by

$$E = \frac{I^2 L}{2}$$

where  $L$  is a constant.

The manufacturer of the coil states that the value of  $L$ , in SI base units, is  $7.5 \times 10^{-6} \pm 5\%$ .  
The current  $I$  in the coil is measured as  $(0.50 \pm 0.02)\text{ A}$ .

The values of  $L$  and  $I$  are used to calculate  $E$ .

Determine the percentage uncertainty in the value of  $E$ .

percentage uncertainty = ..... % [2]

[Total: 6]