MARKS

7

(2, 5)

1. The clearance between a pin and the collar around it is important for the reliable operation of a disc drive for personal computers. Specifications call for the pin to have external diameter 0.525 cm and the collar to have internal diameter 0.526 cm; the clearance will then be 0.001 cm. In practice, both diameters vary from part to part independently of each other. The external diameter, E, of the pin can be modelled by a $N(0.525, 0.0003)$ distribution and the collar internal diameter, I, can be modelled by a $N(0.526, 0.0004)$ distribution.

   (a) Explain briefly why it is reasonable to model the two diameters as being *probabilistically independent.*

   (b) Find the probability the pin will *not* fit inside the collar.

(a)

(b)

Probability (b)