1 **(a)** The distance from the Earth to the Sun is 0.15 Tm. Calculate the time in minutes for light to travel from the Sun to the Earth.

time = …… min [1]

(b) A mass *m* placed on the end of a spring that is hanging vertically, as shown in Fig. 1.1.

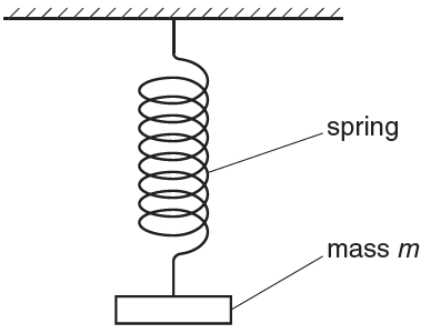

Fig 1.1

The mass is made to oscillate vertically. The period of the oscillations of the mass is *T*. The period *T* is given by

$$T = C\sqrt{\frac{m}{k}}$$

where *C* is a constant and *k* is the spring constant.

Show that *C* has no units. [1]

(c) An experiment is performed to determine the value of C. The data from the experiment are shown in Fig. 1.2.

Quantity	Value with its corresponding SI unit	uncertainty
T	0.242	± 1%
m	0.300	± 2%
k	239	± 3%

Fig. 1.2

(i) Use data from Fig. 1.2 to calculate C with its uncertainty.

C = …… ± …… [3]

(ii) The quantities used to determine *C* should be measured with accuracy and precision. Explain the difference between accuracy and precision.

accuracy: ..……..……
….

……..……
…..

precision: ..……..……
…..

…..……[2]