5 An elastic cord has an unextended length of 13.0 cm. One end of the cord is attached to a fixed point C. A small mass of weight 5.0 N is hung from the free end of the cord. The cord extends to a length of 14.8 cm, as shown in Fig. 5.1.

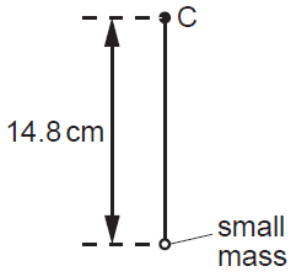

Fig. 5.1

The cord and mass are now made to rotate at constant angular speed ω in a vertical plane about point C. When the cord is vertical and above C, its length is the unextended length of 13.0 cm, as shown in Fig. 5.2.

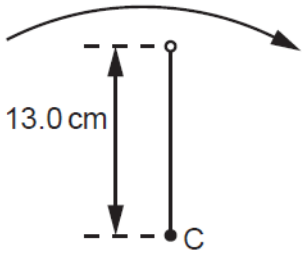

Fig. 5.2

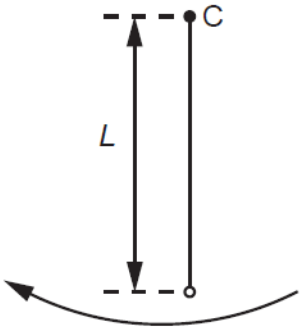

Fig 5.3

(a) Show that the angular speed ω of the cord and mass is 8.7 rad s^{-1}.

[2]

(b) The cord and mass rotate so that the cord is vertically below C, as shown in Fig. 5.3.

Calculate the length *L* of the cord, assuming it obeys Hooke's law.

L = …….cm [3]

[Total: 5]