3 A small bob of mass 0.50 kg is being swung by a string in an anticlockwise vertical circle, as shown in Fig. 3.1. The length of the string is 1.5 m.

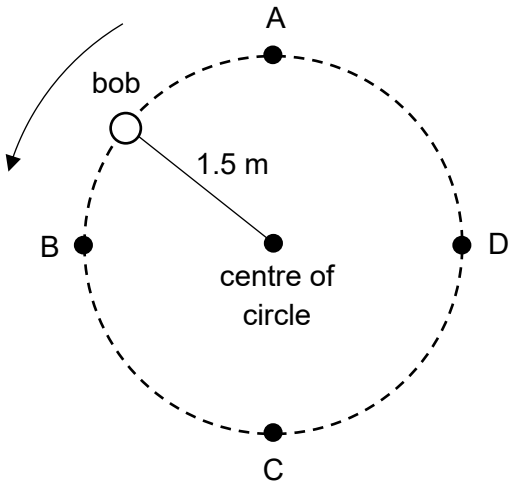

Fig. 3.1

(a) State the angular displacement of the bob when it travels from A to B.

angular displacement = ……rad [1]

(b) When the bob is at A, the tension in the string is 10 N.

Show that the velocity of the bob at A is 6.7 m s^{-1}.

[2]

(c) Calculate the velocity at B.

velocity = ……m s^{-1} [2]

(d) Calculate the angular velocity at B.

angular velocity = ……rad s^{-1} [2]

(e) **(i)** On Fig. 3.2, sketch and label the tension *T* and weight *W* experienced by the bob when it is at D. [1]

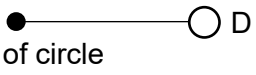

Fig. 3.2

(ii) Explain whether the speed of the bob at D is increasing or decreasing.

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…… [2]