

A particle P of mass 0.4 kg is attached to one end of a light elastic string of natural length 0.5 m and modulus of elasticity 6 N . The other end of the string is attached to a fixed point O . The particle P is released from rest at the point $(0.5 + x)\text{ m}$ vertically below O . The particle P comes to instantaneous rest at O .

(i) Find x . [3]

(ii) Find the greatest speed of P . [5]