

A particle  $P$  of mass  $0.4\text{ kg}$  is attached to a fixed point  $O$  by a light elastic string of natural length  $0.5\text{ m}$  and modulus of elasticity  $20\text{ N}$ . The particle  $P$  is released from rest at  $O$ .

(i) Find the greatest speed of  $P$  in the subsequent motion. [4]

(ii) Find the distance below  $O$  of the point at which  $P$  comes to instantaneous rest. [3]