

A particle  $P$  of mass  $0.3\text{ kg}$  is attached to one end of a light elastic string of natural length  $0.6\text{ m}$  and modulus of elasticity  $24\text{ N}$ . The other end of the string is attached to a fixed point  $O$ . The particle  $P$  is released from rest at the point  $0.4\text{ m}$  vertically below  $O$ .

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

(ii) Calculate the greatest distance of  $P$  below  $O$ . [3]