A particle P of mass 0.5 kg is attached to one end of a light elastic string of natural length 0.8 m and modulus of elasticity 16 N. The other end of the string is attached to a fixed point O. The particle P is released from rest at the point 0.8 m vertically below O. When the extension of the string is x m, the downwards velocity of P is v m s^{-1} and a force of magnitude $25x^2$ N opposes the motion of P.

(i) Show that, when P is moving downwards, $v\dfrac{\mathrm{d}v}{\mathrm{d}x} = 10 - 40x - 50x^2$. [2]

(ii) For the instant when P has its greatest downwards speed, find the kinetic energy of P and the elastic potential energy stored in the string. [6]