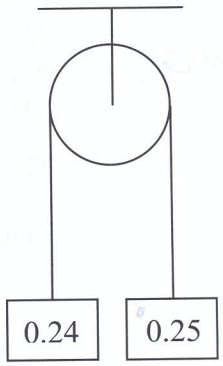
2010 **4.** **(a)** Two particles of masses 0.24 kg and 0.25 kg are connected by a light inextensible string passing over a small, smooth, fixed pulley.



The system is released from rest.

Find **(i)** the tension in the string

(ii) the speed of the two masses when the 0.25 kg mass has descended 1.6 m.

(i) $0.25g - T = 0.25f$

$T - 0.24g = 0.24f$

$0.01g = 0.49f$

$f = 0.2$

$\Rightarrow T = 2.4$ N

(ii) $v^2 = u^2 + 2fs$

$= 0 + 2(0.2)(1.6)$

$v = \sqrt{0.64}$

$v = 0.8$ m s^{-1}