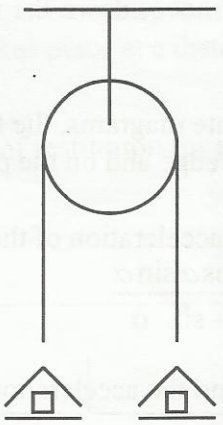
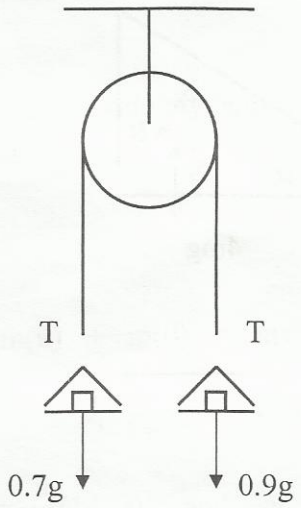
1999

4 (a) Two scale-pans each of mass 0.5 kg are connected by a light inelastic string which passes over a smooth light fixed pulley. A mass of 0.2 kg is placed on one pan and a mass of 0.4 kg is placed on the other pan. The system is released from rest. Calculate



(i) the acceleration of the system

(ii) the forces between the masses and the pans.



(i)

$0.9\,g - T = 0.9\,f$ 5

$T - 0.7\,g = 0.7\,f$ 5

$0.2\,g = 1.6\,f$

$f = \frac{0.2g}{1.6}$ or $\frac{g}{8}$ or 1,225 5

(ii)

$R_1 - 0.2g = 0.2\left(\frac{g}{8}\right)$

$R_1 = 0.225g$ or 2.205 or $\frac{9g}{40}$

$0.4g - R_2 = 0.4\left(\frac{g}{8}\right)$

$R_2 = 0.35g$ or 3.43 or $\frac{7g}{20}$ 5