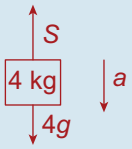
(ii) $v = u + at$
$v = 0 + 7(1)$
$= 7$ m/s

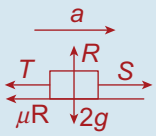
(iii) $u = 7, \quad v = 0, \quad a = -9.8, \quad s = ?$

$v^2 = u^2 + 2as$
$\Rightarrow 0 = 49 + 2(-9.8)s$
$\Rightarrow s = 2.5$ m

Q. 6. (i)



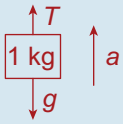
$4g - S = 4a$ **Equation 1**



$R = 2g$

$\Rightarrow \mu R = \frac{1}{2}R = g$

$S - T - g = 2a$ **Equation 2**



$T - g = a$ **Equation 3**

Add equations:

$7a = 2g$

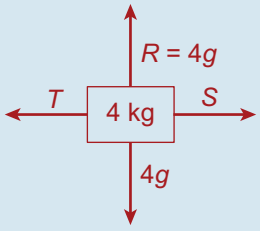
$a = \frac{2g}{7}$

$= 2.8$ m/s

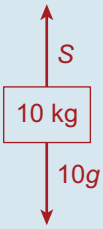
(ii) $\therefore T = 12.6$ N and $S = 28$ N

Q. 7. (i)

$T - g = a$ **Equation 1**



$S - T = 4a$ **Equation 2**



$10g - S = 10a$ **Equation 3**

Add 3 equations:

$15a = 9g$

$\Rightarrow a = \frac{3g}{5}$ m/s^2

(ii) Additional force of $\mu R = \frac{1}{2}(4g) = 2g$ opposing the motion of the 4 kg mass, i.e. to the left.

Equation 2 becomes: $S - T - 2g = 4a$

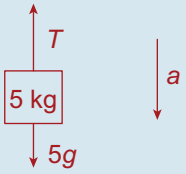
Equation 1: $T - g = a$

Equation 2: $10g - S = 10a$

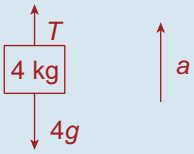
$15a = 7g$

$\Rightarrow a = \frac{7g}{15}$ m/s^2

Q. 8.



$5g - T = 5a$ **Equation 1**



$T - 4g = 4a$ **Equation 2**

Add equations:

(i) $9a = g$

$a = \frac{1}{9}g$ m/s^2

(ii) $T = \frac{40}{9}g$ N

$v = u + at$

$\Rightarrow v = 0 + \left(\frac{1}{9}g\right)(2)$

$= \frac{2}{9}g$ m/s

$v^2 = u^2 + 2as$

$\Rightarrow 0 = \left(\frac{2}{9}g\right)^2 + 2(-g)s$

$\Rightarrow s = \frac{2}{81}g$ metres