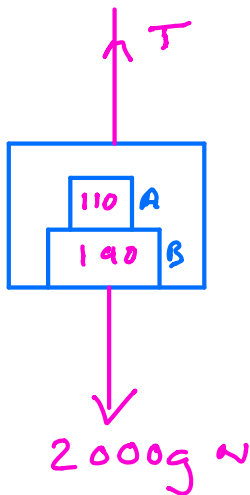


# Connected Particles Exercise 10 E

4)

$1.8 \text{ m s}^{-2} \downarrow$



1700 kg

a) NZL whole system

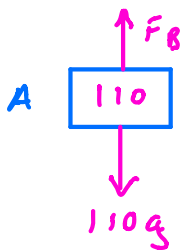
$$2000g - T = 2000 \times 1.8$$

$$2000g - 2000 \times 1.8 = T$$

$$\underline{T = 16000 \text{ N}}$$

b) i)

$1.8 \text{ m s}^{-2} \downarrow$



NZL for A

$$110g - F_B = 110 \times 1.8$$

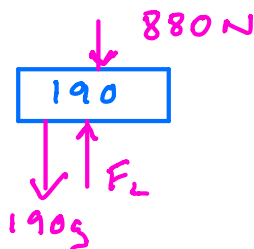
$$110g - 110 \times 1.8 = F_B$$

$$\underline{F_B = 880 \text{ N upwards}}$$

ii)

NZL Action = Reaction

$1.8 \text{ m s}^{-2} \downarrow$



NZL

$$190g + 880 - F_L = 190 \times 1.8$$

$$190g + 880 - 190 \times 1.8 = F_L$$

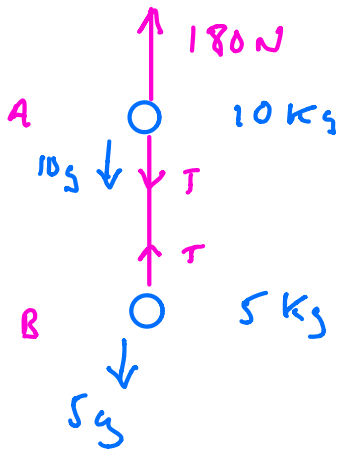
$$F_L = 2400 \text{ N}$$

Force of lift on Block B = 2400 N

$\therefore$  force of Block B on lift floor = 2400 N

downwards

6)



Whole system

$$180 - 15g = 15a$$

$$\frac{180 - 15 \times 9.8}{15} = a$$

$$\underline{a = 2.2 \text{ m/s}^2}$$

b)

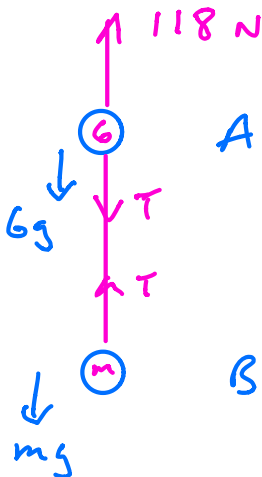
N2L for B

$$T - 5g = 5 \times 2.2$$

$$T = 5 \times 2.2 + 5g$$

$$\underline{T = 60 \text{ N}}$$

7)

 $2 \text{ m/s}^2 \uparrow$ 


a) N2L for whole system

$$118 - (m+6)g = (m+6)a$$

$$118 - mg - 6g = ma + 6a$$

$$118 - 6g - 6a = m(a+g)$$

$$\frac{118 - 6g - 6 \times 2}{2+g} = m$$

$$\underline{m = 4 \text{ kg}}$$

b)

N2L for B

$$T - 4g = 4 \times 2$$

$$T = 4 \times 2 + 4g$$

$$\underline{T = 47.2 \text{ N}}$$