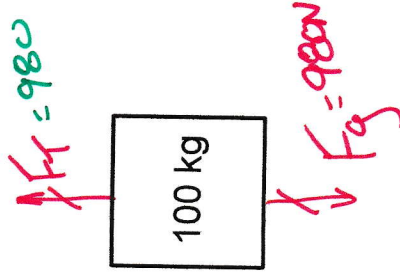


Elevator Problems

Case 1 : At bottom, $V=0$

$$\begin{aligned} \uparrow F_{\text{net}} &= F_T - F_g \\ 0 &= F_T - 980\text{N} \\ F_T &= 980\text{N} \end{aligned}$$

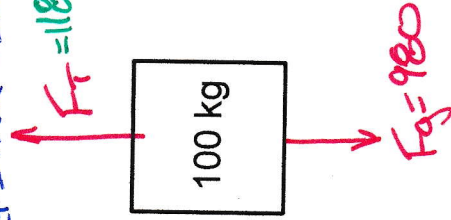
$$\begin{aligned} \alpha &= 0\text{ m/s}^2 \\ F_{\text{net}} &= ma = 0 \end{aligned}$$



Case 2 : at bottom, starting to move up at $a = 2\text{ m/s}^2$

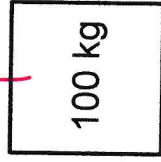
$$\begin{aligned} \uparrow F_{\text{net}} &= F_T - F_g \\ 200\text{N} &= F_T - 980\text{N} \\ F_T &= 1180\text{N} \end{aligned}$$

$$\begin{aligned} \alpha &= 2\text{ m/s}^2 \\ F_{\text{net}} &= ma = 200\text{N} \end{aligned}$$



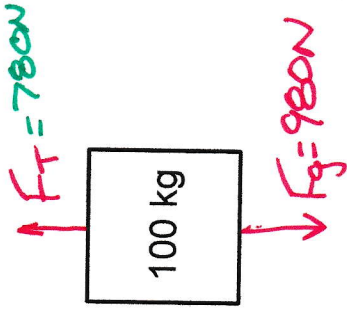
Case 3 : travelling upwards at constant velocity 4 m/s .

$$\begin{aligned} \alpha &= 0\text{ m/s}^2 \\ F_{\text{net}} &= \phi \\ F_T &= 980 \end{aligned}$$



$$\begin{aligned} \uparrow F_{\text{net}} &= F_T - F_g \\ F_T &= 980\text{N} \end{aligned}$$

Case 4 : at top, slowing down at top at $a = -2\text{ m/s}^2$



$$\begin{aligned} \alpha &= -2\text{ m/s}^2 \\ F_{\text{net}} &= -200\text{N} \end{aligned}$$

$$\begin{aligned} \uparrow F_{\text{net}} &= F_T - F_g \\ -200 &= F_T - 980\text{N} \\ F_T &= 780\text{N} \end{aligned}$$