The mass of the worker \( m_1 = 50 \text{ kg} \). The mass of the block at the end of the rope, \( m_2 = 100 \text{ kg} \).

\[
\begin{array}{c}
\text{T} \\
\text{a}
\end{array}
\begin{array}{c}
\text{T} \\
\text{a}
\end{array}
\begin{array}{c}
m_2 \quad \text{a}
\end{array}
\begin{array}{c}
m_1 \quad \text{a}
\end{array}
\]

Determine the acceleration.

A) \[ a = \frac{m_2}{m_1} g = 2g \]

B) \[ a = \frac{m_2 - m_1}{m_1} g = g \]

C) \[ a = \frac{m_2 - m_1}{m_1 + m_2} g = \frac{1}{3}g \]

Applying “\( F = ma \)” on the \( m_1 + m_2 \) mass system.

The net force is \( m_2 g - m_1 g = (m_1 + m_2)a \). This leads to

\[ a = \frac{m_2 - m_1}{m_1 + m_2} g = \frac{1}{3}g. \]

Answer C.

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