$$\begin{cases} \left(m_1 + m_2\right) l_1^2 \ddot{\alpha}_1 + m_2 l_1 l_2 \ddot{\alpha}_2 + \left(m_1 + m_2\right) g l_1 \alpha_1 = 0 \\ m_2 l_1 l_2 \ddot{\alpha}_1 + m_2 l_2^2 \ddot{\alpha}_2 + m_2 g l_2 \alpha_2 = 0 \end{cases}.$$