13. (a) We refer to the copper block as block 1 and the lead block as block 2. The equilibrium temperature T_f satisfies $m_1c_1(T_f - T_{i,1}) + m_2c_2(T_f - T_{i,2}) = 0$, which we solve for T_f:

$$\begin{aligned} T_f &= \frac{m_1c_1T_{i,1} + m_2c_2T_{i,2}}{m_1c_1 + m_2c_2} \\ &= \frac{(50\,\text{g})(386\,\text{J/kg}\cdot\text{K})(400\,\text{K}) + (100\,\text{g})(128\,\text{J/kg}\cdot\text{K})(200\,\text{K})}{(50\,\text{g})(386\,\text{J/kg}\cdot\text{K}) + (100\,\text{g})(128\,\text{J/kg}\cdot\text{K})} \\ &= 320\ \text{K} . \end{aligned}$$

(b) Since the two-block system in thermally insulated from the environment, the change in internal energy of the system is zero.

(c) The change in entropy is

$$\begin{aligned} \Delta S &= \Delta S_1 + \Delta S_2 = m_1c_1 \ln\left(\frac{T_f}{T_{i,1}}\right) + m_2c_2 \ln\left(\frac{T_f}{T_{i,2}}\right) \\ &= (50\,\text{g})(386\,\text{J/kg}\cdot\text{K}) \ln\left(\frac{320\,\text{K}}{400\,\text{K}}\right) + (100\,\text{g})(128\,\text{J/kg}\cdot\text{K}) \ln\left(\frac{320\,\text{K}}{200\,\text{K}}\right) \\ &= +1.72\ \text{J/K} . \end{aligned}$$