76. We do not employ energy conservation since, in reaching equilibrium, some energy is dissipated either as heat or radio waves. Charge is conserved; therefore, if $Q = 48\,\mu$C, and q_1 and q_3 are the charges on C_1 and C_3 after the switch is thrown to the right (and equilibrium is reached), then

$$Q = q_1 + q_3 \quad .$$

We note that $V_{1 \text{ and } 2} = V_3$ because of the parallel arrangement, and $V_1 = \frac{1}{2} V_{1 \text{ and } 2}$ since they are identical capacitors. This leads to

$$\begin{aligned} 2V_1 &= V_3 \\ 2\frac{q_1}{C_1} &= \frac{q_3}{C_3} \\ 2q_1 &= q_3 \end{aligned}$$

where the last step follows from multiplying both sides by $2.00\,\mu$F. Therefore,

$$Q = q_1 + (2q_1)$$

which yields $q_1 = 16\,\mu$C and $q_3 = 32\,\mu$C.