67. (a) The equivalent capacitance is $C_{\text{eq}} = C_1C_2/(C_1 + C_2)$. Thus the charge q on each capacitor is

$$q = C_{\text{eq}}V = \frac{C_1C_2V}{C_1 + C_2} = \frac{(2.0\,\mu\text{F})(8.0\,\mu\text{F})(300\,\text{V})}{2.0\,\mu\text{F} + 8.0\,\mu\text{F}} = 4.8 \times 10^{-4}\ \text{C}\ .$$

The potential differences are: $V_1 = q/C_1 = 4.8 \times 10^{-4}\,\text{C}/2.0\,\mu\text{F} = 240\,\text{V}$, $V_2 = V - V_1 = 300\,\text{V} - 240\,\text{V} = 60\,\text{V}$.

(b) Now we have $q_1'/C_1 = q_2'/C_2 = V'$ (V' being the new potential difference across each capacitor) and $q_1' + q_2' = 2q$. We solve for q_1', q_2' and V:

$$\begin{aligned} q_1' &= \frac{2C_1q}{C_1 + C_2} = \frac{2(2.0\,\mu\text{F})(4.8 \times 10^{-4}\,\text{C})}{2.0\,\mu\text{F} + 8.0\,\mu\text{F}} = 1.9 \times 10^{-4}\ \text{C}\ , \\ q_2' &= 2q - q_1 = 7.7 \times 10^{-4}\ \text{C}\ , \\ V' &= \frac{q_1'}{C_1} = \frac{1.92 \times 10^{-4}\,\text{C}}{2.0\,\mu\text{F}} = 96\ \text{V}\ . \end{aligned}$$

(c) In this circumstance, the capacitors will simply discharge themselves, leaving $q_1 = q_2 = 0$ and $V_1 = V_2 = 0$.