47. (a) The voltage difference V across the capacitor varies with time as $V(t) = \mathcal{E}(1 - e^{-t/RC})$. At $t = 1.30\,\mu\text{s}$ we have $V(t) = 5.00\,\text{V}$, so $5.00\,\text{V} = (12.0\,\text{V})(1 - e^{-1.30\,\mu\text{s}/RC})$, which gives $\tau = (1.30\,\mu\text{s})/\ln(12/7) = 2.41\,\mu\text{s}$.

(b) $C = \tau/R = 2.41\,\mu\text{s}/15.0\,\text{k}\Omega = 161\,\text{pF}$.