$$V(t) = \frac{q(t)}{c} = \frac{1}{c}\int i(t)dt \longrightarrow \int i(t)dt = cV(t)$$

From the two sides of the relationship, we get a derivative with respect to time

$$i(t) = c\,\frac{dV(t)}{dt}$$

Now we take the Laplace transform from both sides

$$\underbrace{\int_0^\infty e^{-st} i(t)dt}_{I(s)} = c\int_0^\infty e^{-st}\,\frac{dV(t)}{dt}\,dt$$

We use the integral except for except

$$\int udv = uv - \int vdu$$

So, we have

$$\begin{aligned}
\longrightarrow I(s) &= ce^{-st}V(t)\big|_0^\infty - c\int_0^\infty V(t)\frac{de^{-st}}{dt}\,dt \\
&= \frac{cV(\infty)}{e^\infty} - \frac{cV(0)}{e^0} - c\int_0^\infty (-s)e^{-st}V(t)dt \\
&= 0 - cV(0) + cs\underbrace{\int_0^\infty e^{-st}V(t)dt}_{V(s)}
\end{aligned}$$

$$\longrightarrow I(s) = csV(s) - cV(0)$$

Finally

$$\therefore \quad V(s) = \frac{I(s)}{cs} + \frac{V(0)}{s}$$