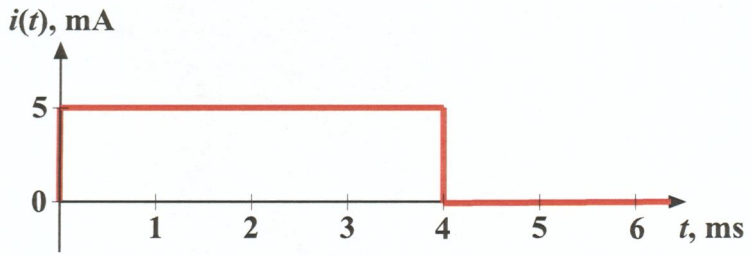
EE 2240

Problem #07

The current through a 10 μF capacitor is given by the waveform shown. Accurately sketch the waveform for the voltage across the capacitor if it is initially uncharged.



$$v(t) = v(0) + \frac{1}{C}\int_0^t i(t)\,dt$$

$$= 0 + 10^5 \int_0^t i(t)\,dt$$

$$= \begin{cases} 0 : & t = 0 \\ 10^5 \times 0.005t = 500t\,V : & 0 < t < 4\,ms \\ 10^5 \times 0.005 \times 0.004 = 2\,V : & 4\,ms < t \end{cases}$$