14. (a) When the switch closes the cap must supply all the current to the R-line until the current stops flowing. This time will be $2 \times t_d$. The current will be \[ I_{dc} = \frac{V_{dd}}{R_t + Z_0} = \frac{3.3}{100} = 0.033 \text{ A} \]

\[ i_c = C \frac{dV}{dt} \]

\[ 0.033 = C \frac{100 \text{ mV}}{4 \times 10^3} \]

\[ C = 1.32 \text{nF or } 1.32 \text{pF} \]

(b) Yes. The time during which current must be supplied is twice as long. It would need to be $2.64 \text{pF}$.

With the parallel termination, the instantaneous current required will double.

\[ I = \frac{V_{dd}}{Z_0} = \frac{3.3}{50} = 0.066 \text{A} \]

With the original $2k\Omega$ line a $2640 \text{pF}$ decoupling cap resistor would be needed.