

Homework #3 (due on 02/13)

Boas Chapter 7

3.8; 4.11; 5.1; 6.1; 7.1; 8.1; 9.15; 9.23; 10.4; 10.5;

Extra-credit problem – Relaxation oscillator

The capacitor shown in the figure is charged by the battery and discharges through the light bulb when the potential across is equal $0.9V$. Assuming that the capacitor discharges very rapidly, sketch the potential across the capacitor as a function of time and show that it is equal $V_C = V(1 - e^{-t/RC})$, $0 < t < RC \ln 10$, and repeats periodically with period $RC \ln 10$. Find the Fourier series with period T that represents this function.

