ECE 398GG Prof. George Gross
Spring 2023

Homework 6 Solution

Date due: Friday, March 10, 2023

1. In Lecture 9, we saw how to create switching patterns for the three legs of the inverter to generate an *AC* waveform from a *DC* source. We created a table that shows how different phase voltages (V_{an}, V_{bn}, V_{cn}) are produced for a specified (g_a, g_b, g_c) switch configuration. Let us take this knowledge to the next step. You are aked to **construct** a sequence of switch configurations that is deployed to generate an *AC* voltage as the output. We start at the initial switch configuration of (V_{an}, V_{bn}, V_{cn}) = (1, 0, 0), i.e., the top switch of leg *A* is ON and the bottom switches of legs *B* and *C* are ON. For the sequence of switch configurations you constructed, please **provide** a set of comments that summarize the insights you garnered from the analysis that you carried out.

Solution

A possible solution can be a sequence as follows :

{(1,0,0) ; (1,1,0) ; (0,1,0; (0,1,1) ; (0,0,1) ; (1,0,1)}

achieves an *AC* voltage waveform at the output. Please note that there may be other solutions as well. Also, as you shorten the duration of each configuration, you construct a “smoother “ curve.