ECE 320 - Homework #7

DC to AC Converters, SCR, Differential Amplifier. Due Monday, October 8st, 2018

DC to AC Converters.

1) Using an H-bridge with a 24.4V source, you can generate the waveform shown below. From the lecture notes,

- If T = 0, the efficiency is 81% (81% of the energy in this waveform is in its 1st harmonic)
- If T = 1/6, the efficiency is 91.1%

What is the optimal value of T? (i.e. what value maximizes the energy in the 1st harmonic?)



SCR:

2) Assume the following circuit has a firing angle of 47 degrees. Determine the voltages at V1 and V2 (DC and AC)

3) Determine R, L, and C, and firing angle so that the following SCR has

- A DC votlage of 5.00V at V2
- A peak-to-peak ripple of 200mVpp at V2, and
- Draws 100mA at V2.



Differential Amplifier

- 4) For the following circuit
 - Write the voltage node equations
 - Solve for the voltages using Matlab (or similar program)



- 5) For the following circuit
 - Write the voltage node equations
 - Solve for the voltages

