

ECE 320 - Homework #7

DC to AC Converters, SCR's Due Monday, February 25th, 2019

DC to AC

Problem 1-3) Find the efficiency of the following DC to AC converters.

i.e. find the percentage of the energy in the 1st harmonic

$$1) \quad x(t) = \begin{cases} -10V & 0 < t < 0.5 \\ +10V & 0.5 < t < 1 \end{cases}$$

$$2) \quad x(t) = \begin{cases} +10V & 0 < t < 0.25 \\ -10V & 0.5 < t < 0.75 \\ 0 & \text{otherwise} \end{cases}$$

$$3) \quad x(t) = \begin{cases} +10V & 0 < t < 0.33 \\ -10V & 0.5 < t < 0.83 \\ 0 & \text{otherwise} \end{cases}$$

SCR

4) Assume a firing angle of 40 degrees. Determine the voltage at V1 and V2 (DC and AC)

5) Modify this circuit so that the voltage at V2 is 5.00V (DC) with 250mVpp ripple.

6) Check your answer for problem #5 in PartSim

