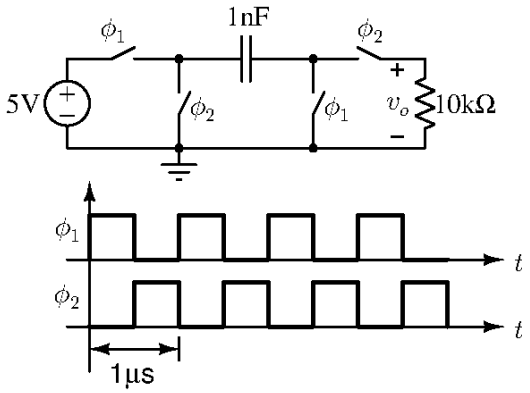
EE3703: Analog Circuits Laboratory
Dept. of Electrical Engg., IIT Madras
Nagendra Krishnapura (nagendra@ee.iitm.ac.in)

Experiment 4: Charge pump negative voltage generator

Answer the following for the circuit below. The square waves have 50% duty cycle.



1) Sketch the voltage v_o across the resistor after steady state is reached. Mark key points on the x and y axes. The approximation $\exp(x) \approx 1+x, x \ll 1$ maybe useful here.

2) Determine the average power drawn from the 5V source after steady state is reached.

3) Determine the power dissipated in the resistor after steady state is reached.

4) (Not a mandatory question, but fun to think about) Is the power drawn from the 5V source exactly equal to the power dissipated in the resistor? If not, explain the discrepancy.