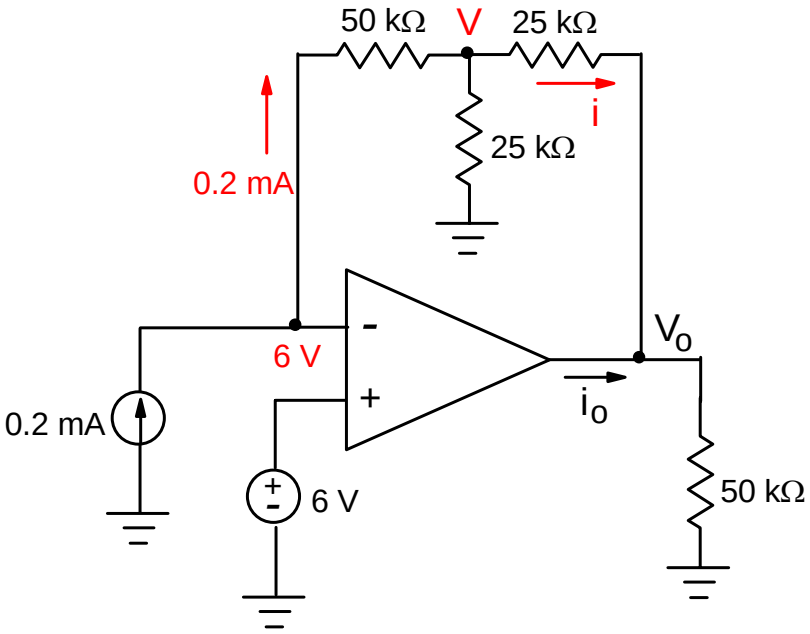
ECE 35 Quiz-2 (Spring 2017) Name/pid: _____

Two problems, 5 pts each:

1. Find V_o, i_o.



Solution:

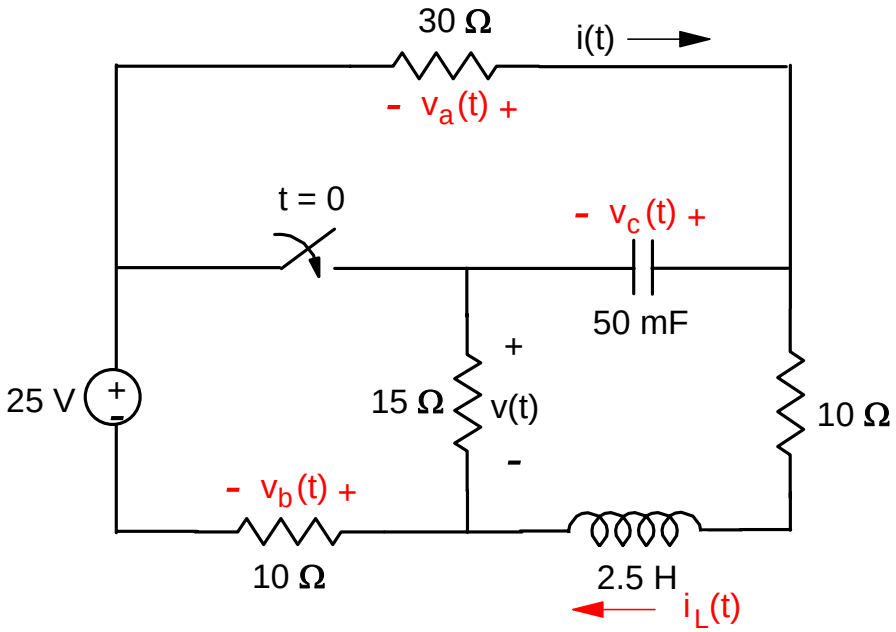
$V = 6 – 0.2\times50 = –4$ V

$i = 0.2 – V/25 = 0.36$ mA

$V_o = V – 25\times i = –13$ V.

$i_o = V_o/50 – i = –0.62$ mA.

2. Switch was open for t < 0 and steady state is reached. Switch closes at t = 0. Find i(0-), i(0+), v(0-), v(0+).



Solution:

t < 0, switch open, steady state → capacitor = open ckt.
inductor = short ckt.

$i(0-) = i_L(0-) = 25/(30 + 10 + 10) = 0.5$ A,

$v(0-) = 0$,

$v_c(0-) = 10 \times i(0-) = 5$ V.

t = 0, switch closed, $i_L(0+) = i_L(0-) = 0.5$ A,

$v_c(0+) = v_c(0-) = 5$ V.

→ $i(0+) = -v_a(0+)/30 = -v_c(0+)/30 = -1/6$ A.

KVL lower left loop, $v_b(0+) = 25 - v(0+)$

KCL lower center node, $v(0+)/15 + i_L(0+) = v_b(0+)/10$

→ $v(0+) = 12$ V. (2 pts)