CASE WESTERN RESERVE UNIVERSITY
Case School of Engineering
Department of Electrical Engineering and Computer Science

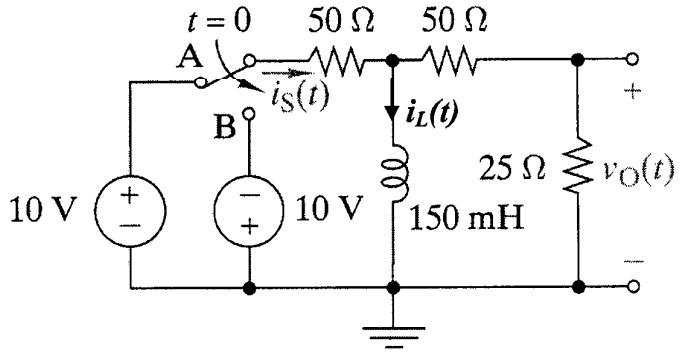
ENGR 210. Introduction to Circuits and Instruments (4)

Quiz No. 11 11/21/03

Name (*Section*): Solutions.

PUT ANSWERS IN THE SPACE PROVIDED AND SHOW YOUR WORK

Problem 1 (10 points)
In the circuit shown here, the switch has been in position A for a long time, and is set to position B at t = 0. Find the initial and final values of the state variable i_L, the time constant T_C, and write the expression for $i_L(t)$ for t > 0. *Numerical* values are required. Complete the table.



VARIABLE	VALUE / EXPRESSION
Initial value $i_L(t = 0)$	0.2 A
Final value $i_L(t > \infty)$	−0.2 A.
Time constant T_C, for t > 0	5m
Inductor current $i_L(t)$, t > 0	$0.4\,e^{-t/5m} - 0.2$

(over)

Problem 2 (10 points)

Write the following phasors as sinusoidal waveforms, i.e. in the form A $\cos(\omega t + \phi)$. Numerical values are required for A, ω, and ϕ. Complete the table.

PHASOR	COS()
$20 + j20$, $\omega = 500$ rad/sec	$20\sqrt{2}\cos(500t + 45°)$
$10\sqrt{2} \angle -45°$, $\omega = 500$ rad/sec	$10\sqrt{2}\cos(500t - 45°)$

(over)