ECE 214 — Exam #2

Estimated time for completion: \leq 1.25 hour 24 April 2018

Rules of the Exam

- Rule 1: The examination period begins at 11:00 am on Tuesday, 24 April 2018 and ends at 12:15 pm on Tuesday, 24 April 2018.
- Rule 2: The exam is worth 15 points.
- **Rule 3:** There are three problems, and each problem is worth 6 points. The maximum score is 18 out of 15.
- Rule 4: The exam is closed book and closed notes. You may use your ECE 214 Laboratory Notebook, a ruler, and a calculator.
- Rule 5: To receive credit for an answer include the units along with the numerical answer.
- Rule 6: <u>Show all work</u> answers without supporting work will not receive credit.
- Rule 7: Do not leave the room until you have completed the exam.

Name

Problem 1: In the circuit below, switch S has been closed for a long time and then opens at t = 0.



Complete the table on page 3, and derive the equation describing $V_{C}(t)$ for $t \ge 0$.

	$t = 0^-$	$\mathbf{t} = 0^+$	$\mathbf{t} = \infty$
I _S			
$V_{\rm L}$			
$V_{\rm R}$			
V _C			

What is the equation for $V_C(t)$ for $t \ge 0$?

Problem 2: Consider the circuit below:



a) Draw the Thévenin equivalent circuit representing terminals **A** and **B**.

b) Draw the Thévenin equivalent circuit representing terminals **A** and **C**.

c) Draw the Thévenin equivalent circuit representing terminals **B** and **C**. **Problem 3:** Consider the circuit below:



Part A: When $R_E = 0 \Omega$, $R_S = R_{\pi} = R_L = 10 \Omega$, and $\beta = 99$, what is the equivalent resistance between terminals **A** and **B**?

- **Part B:** When $R_S = 0 \Omega$, $R_E = R_{\pi} = R_L = 10 \Omega$ and $\beta = 99$, what is the equivalent resistance between terminals **A** and **B**?
- **Part B:** When $R_E = R_S = R_{\pi} = R_L = 10 \Omega$ and $\beta = 99$, what is the equivalent resistance between terminals **A** and **B**?

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