Name: _____ (please print)

Signature: _____

ECE 2202 – Quiz #1

February 13, 2018

Keep this quiz closed and face up until you are told to begin.

1. This quiz is closed book, closed notes. You may use one 8.5" x 11" crib sheet, or its equivalent.

2. Show all work on these pages. Show all work necessary to complete the problem. A solution without the appropriate work shown will receive no credit. A solution which is not given in a reasonable order will lose credit.

3. It is assumed that your work will begin on the same page as the problem statement. If you choose to begin your work on another page, you must indicate this on the page with the problem statement, with a clear indication of where the work can be found. **If your work continues on to another page, indicate clearly where your work can be found. Failure to indicate this clearly will result in a loss of credit.**

4. Show all units in solutions, intermediate results, and figures. Units in the quiz will be included between square brackets.

5. Do not use red ink. Do not use red pencil.

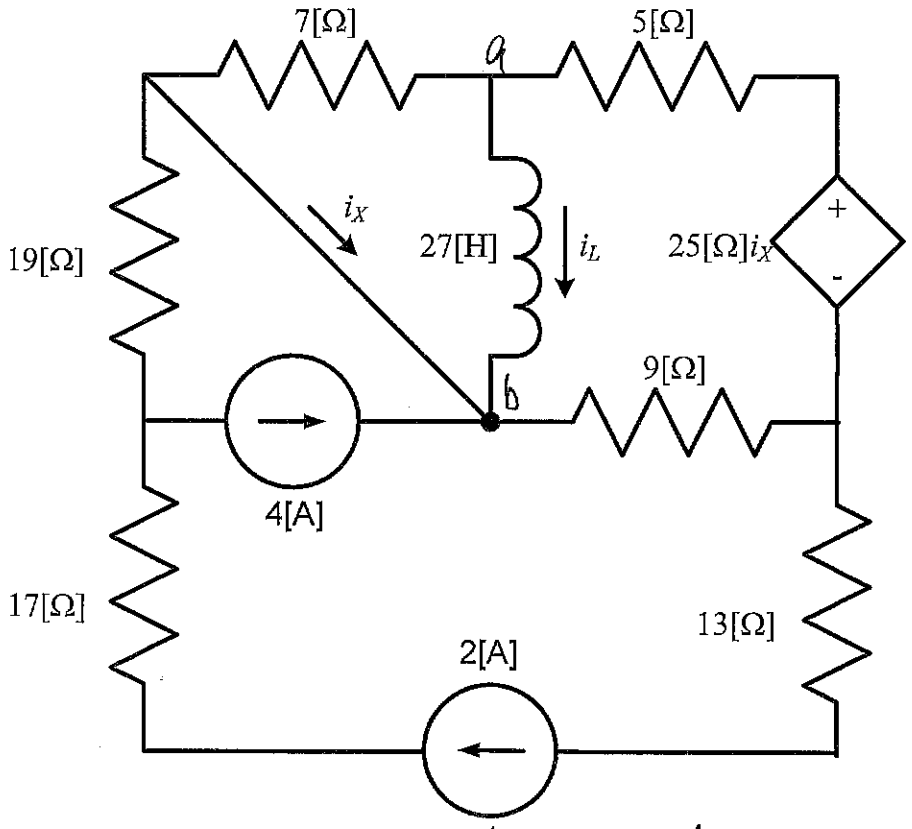
6. You will have 30 minutes to work on this quiz.

_____/20

Room for extra work

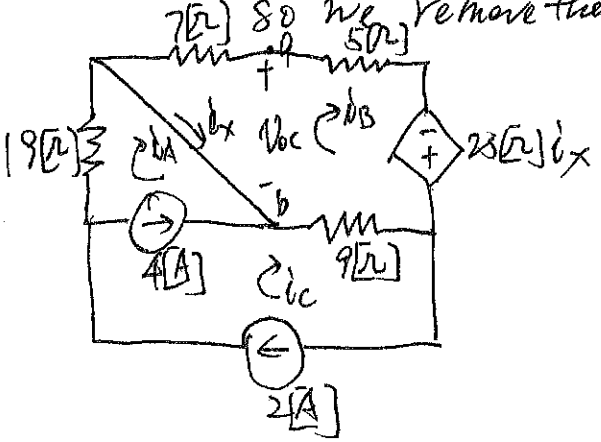
Use the circuit below to solve:

a) Find the Thevenin equivalent as seen by the 27[H] inductor.
b) The circuit has been stable for a long time, find the current through the inductor i_L.



We begin by labeling the terminals of the inductor, a and b.
Then we take the inductor out and redraw the circuit.

For Voc The 17[Ω] resistor and 13[Ω] resistor are in series with a current source, and we are looking outside the series combination, so we remove them.



Mesh current: $i_A - i_C = -4\,[A]$

$i_B(7+5)[\Omega] + 25[\Omega]\,i_x + (i_B - i_C)9[\Omega] = 0$

$i_C = 2[A]$

$i_x = i_A - i_B$

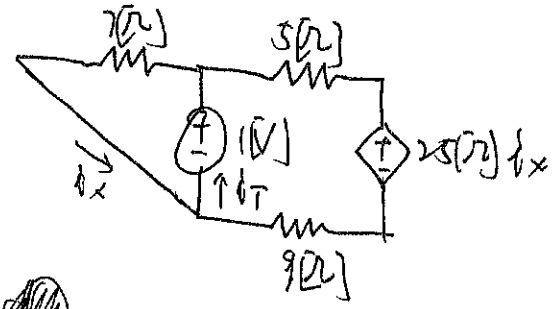
$V_{oc} + i_B 7[\Omega] = 0$

We have: $V_{oc} = 119[V] = V_{th}$.

See next page

Room for extra work

For. R_{eq}. set indep. sources = 0 | Apply a test source.



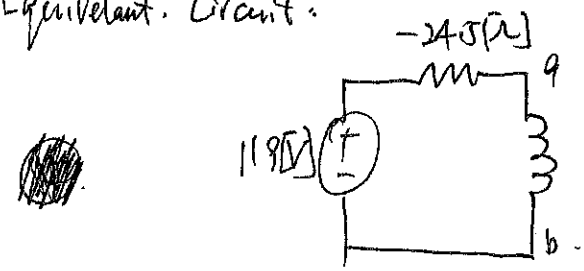
$$i_x = \frac{1[V]}{7[\Omega]}$$

$$-i_T + i_x + \frac{1[V] - 25[\Omega]\, i_x}{(9+5)[\Omega]} = 0$$

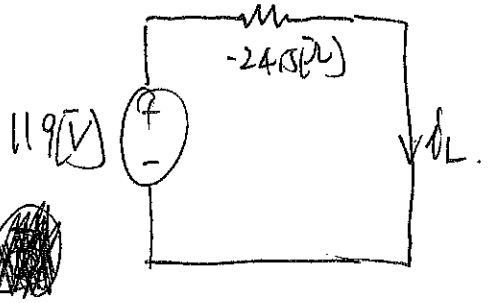
$$R_{eq} = \frac{1[V]}{i_T}$$

Solving | $R_{eq} = -24.5[\Omega] = R_{th}$.

a). Thevinin Equivelant. Circuit.



b). Since the circuit has been stable for a long time; inductor will be a wire.



$$i_L = \frac{119[V]}{-24.5[\Omega]} = -4.85\,[A].$$

Room for extra work