

EE 2301 Basic Electronic Circuit
2010-2011 Semester A
Pre-Quiz Assignment 2

Instructions:

1. Please submit a softcopy and a hardcopy of your assignment. No mark will be given if any one of it is missing.
2. The softcopy should be submitted through BB before 18 Oct 2010 11:55pm (Monday) which is the official deadline of this assignment. 25% of your score will be deducted for late submission.
3. The hardcopy should then be submitted to your class tutor during the tutorial class of Week 8.
4. You are not required to type your working in word document. Instead, you can scan your hardcopy in pdf or words format for softcopy submission.
5. Plagiarism is a serious misconduct according to University Code of Conduct. The most severe penalty may lead to a termination of study. Please note that the one who copy or allow other to copy may face the same penalty.

Attempt all the questions (total 50 marks)

1. For the circuit shown in Figure 1: (15 marks)
 - a) Find both the Norton and Thevenin equivalent seen across terminal a and b
 - b) Hence write down the value of the load R_L when connects across a-b for achieving maximum power transfer to R_L .

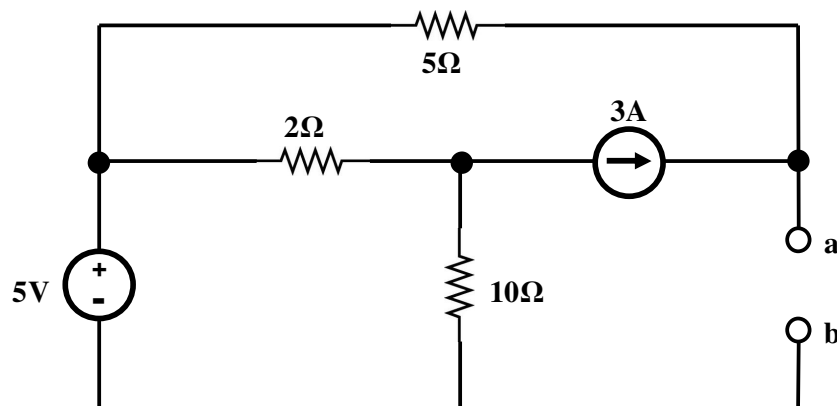


Figure 1

2. For the Wheatstone bridge in Figure 2:

(15 marks)

- Find the Thevenin equivalent circuit seen across a and b
- If $R_1 = R_4 = R_0 - \Delta R$, $R_2 = R_3 = R_0 + \Delta R$, and $|R_0|^2 \gg |\Delta R|^2$, show that $R_{th} = R_0$ and $V_{th} = (\Delta R/R_0)V_S$.

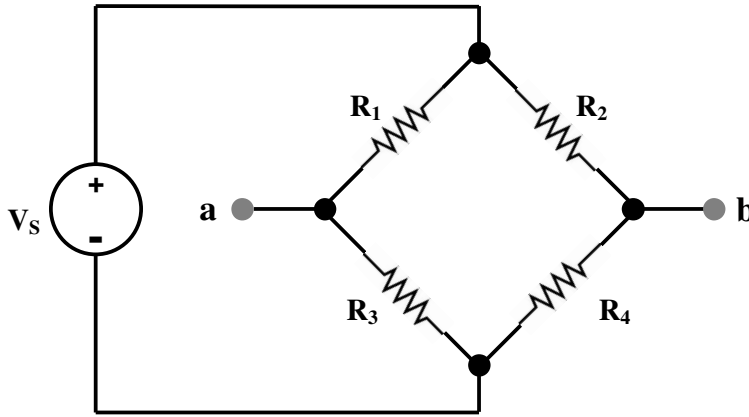


Figure 2

3. Answer the following questions regarding the circuit shown in Figure 3. Assume a steady state condition is achieved for $t < 0$. Given that $R_1 = 10 \, \Omega$, $R_2 = 6 \, \Omega$, $R_3 = 12 \, \Omega$, $L = 0.1 \, \text{H}$, $V_S = 3 \, \text{V}$ (20 marks)

- Write down the differential equation for $t > 0$ and write down the time constant.
- Determine the initial and the final conditions. Hence write down the full response.
- Find the voltage across the inductor just after the switch is closed.
- After the switch has been closed for a long time, the switch is opened once again. Find the time constant for this.

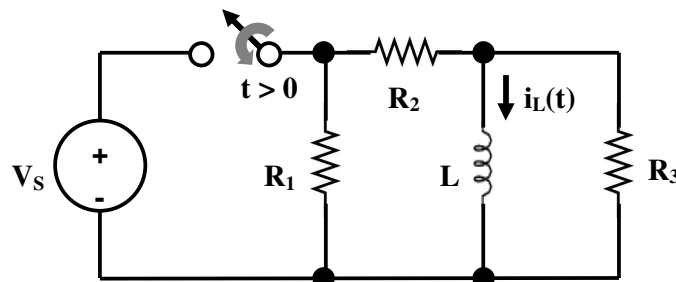


Figure 3

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