LUMS
A Not-for-Profit University

Department of Electrical Engineering
School of Science and Engineering

# EE240 Circuits I - Fall 2021

# ASSIGNMENT 3

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**Due Date:** 12:15pm, Thursday, November 11, 2021 (Submit in-class)
**Format:** 8 problems, for a total of 90 marks

**Instructions:**

- You will be working in pairs for this assignment. The predesignated list of pairs will be communicated by email. We require each student to solve 4 out of 8 problems.
- Solve the assignment on blank A4 sheets and submit after the class.
- One individual from every group must submit in-class or upload the solved assignment on LMS in the "Assignments" tab under Assignment 3.
- Naming convention should be as follows: "Name_GroupName_Assignment_3.pdf"
- Feel free to contact the instructor or the teaching assistants if you have any concerns.

- You represent the most competent individuals in the country, do not let plagiarism come in between your learning. In case any instance of plagiarism is detected, the disciplinary case will be dealt with according to the university's rules and regulations.

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**Course Learning Outcomes Covered:**

Formulate network equations based on the understanding of Krichhoff's voltage and current laws.

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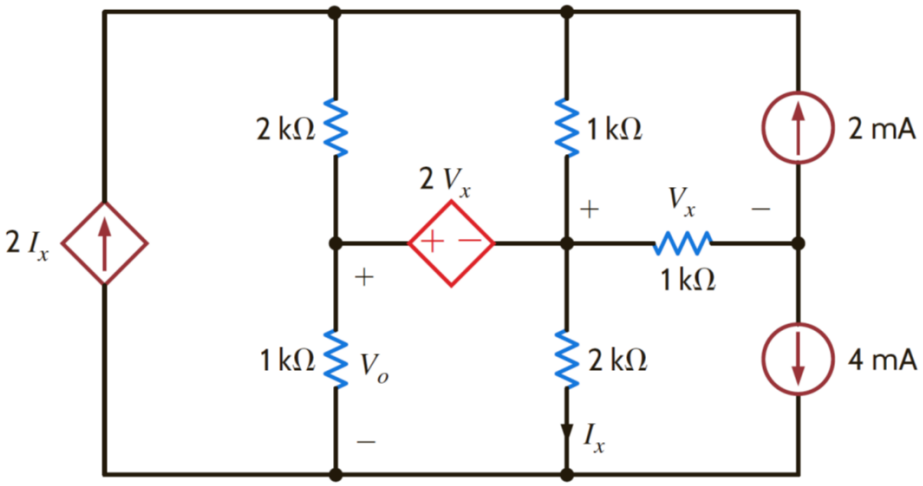
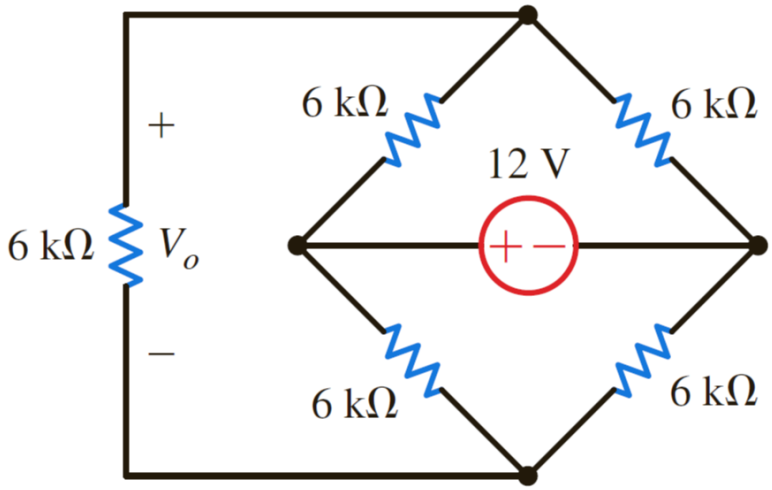
**Problem 1** (10 marks)

Use loop analysis to find $V_o$ in the circuit given below.



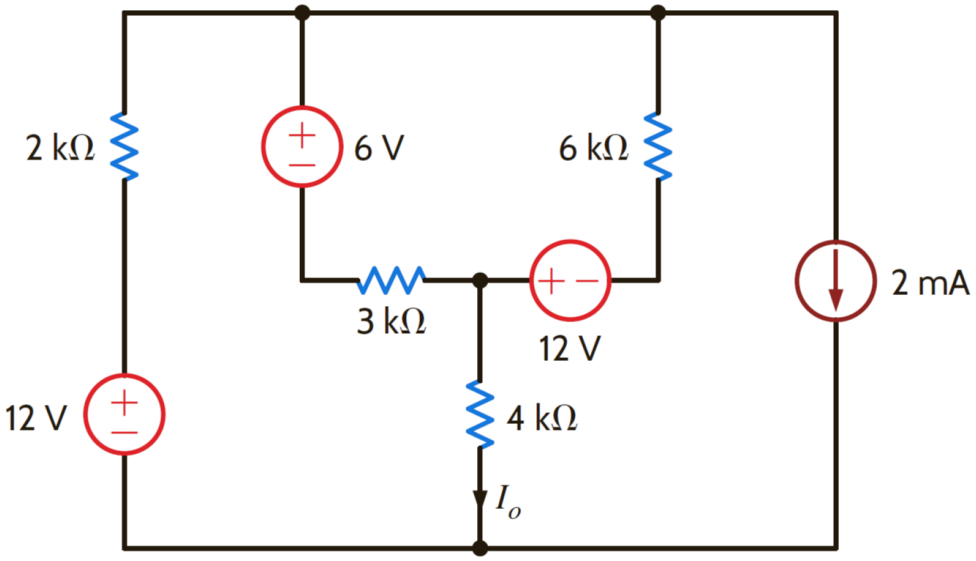
**Problem 2** (10 marks)

Use nodal analysis to find $V_o$ in the circuit given below.



**Problem 3** (12 marks)

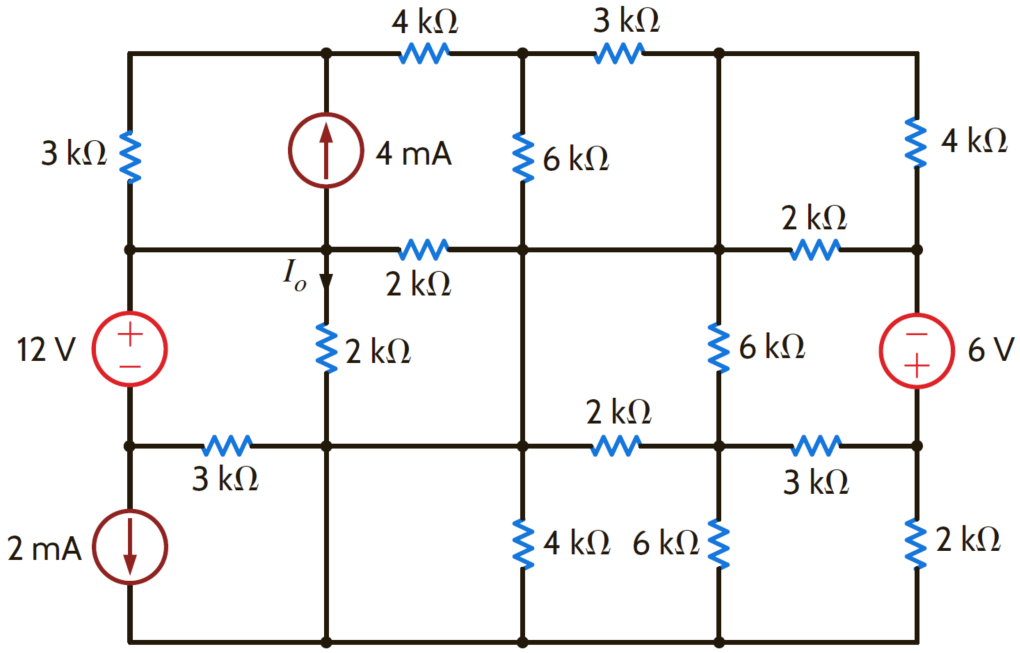
For the circuit given below, find $I_o$ using superposition principle.



## Problem 4 (10 marks)

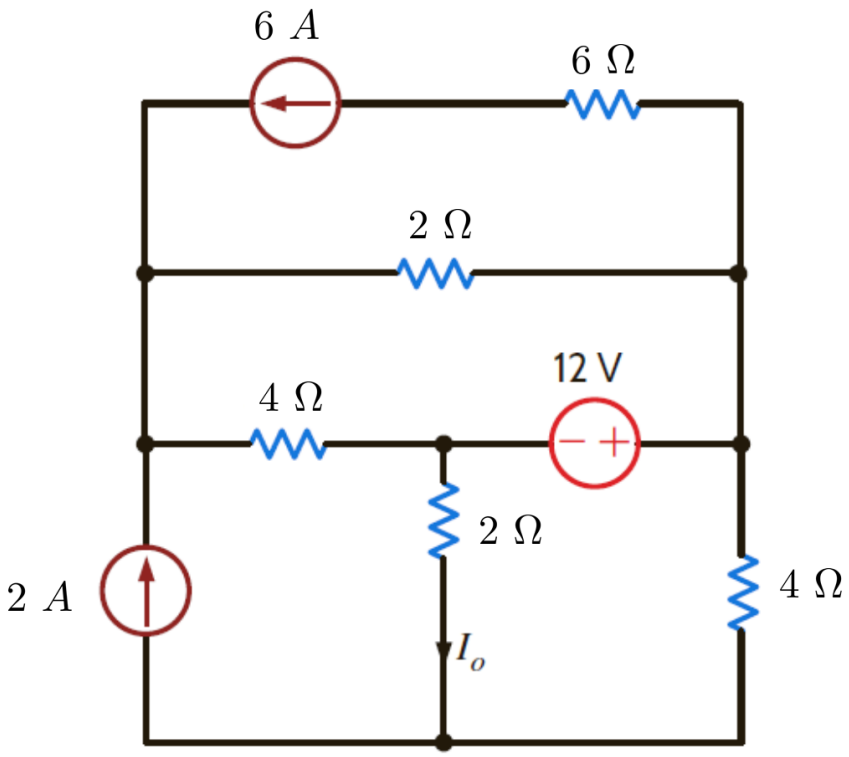
For the circuit given below, find $I_o$ using source transformation.

**Hint:** Remove the redundant components before applying source transformation.



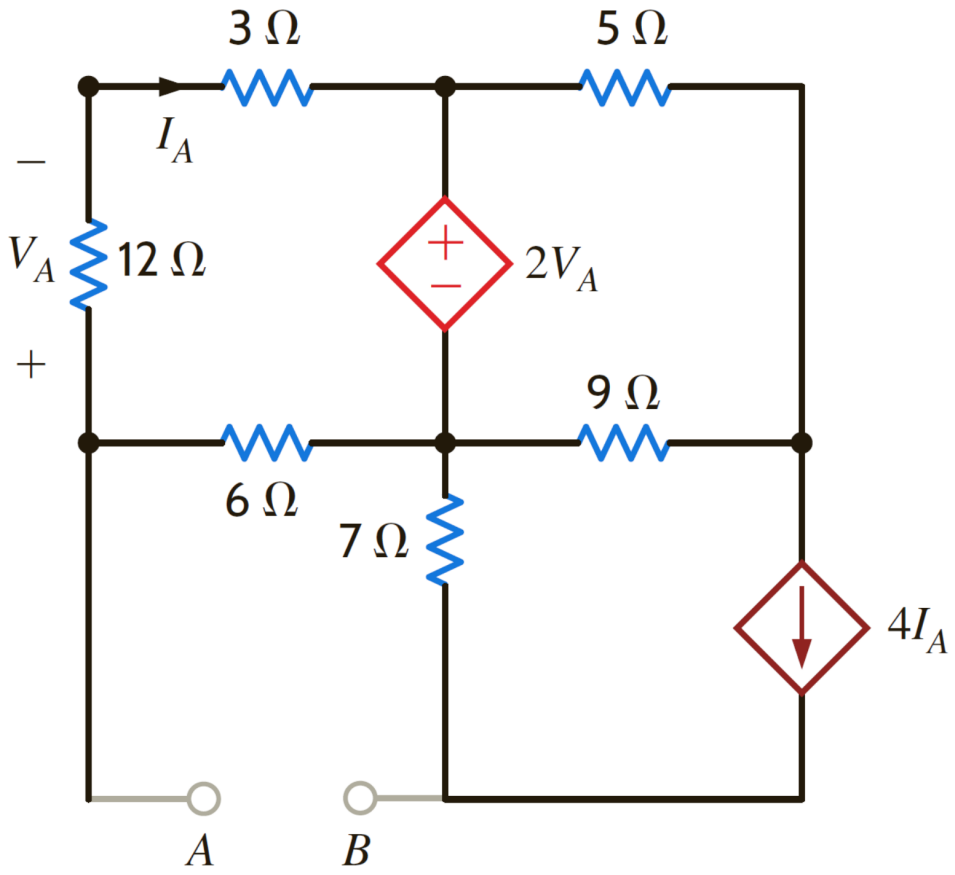
**Problem 5** (10 marks)

Find $I_o$ in the circuit given below using Thevenin theorem.



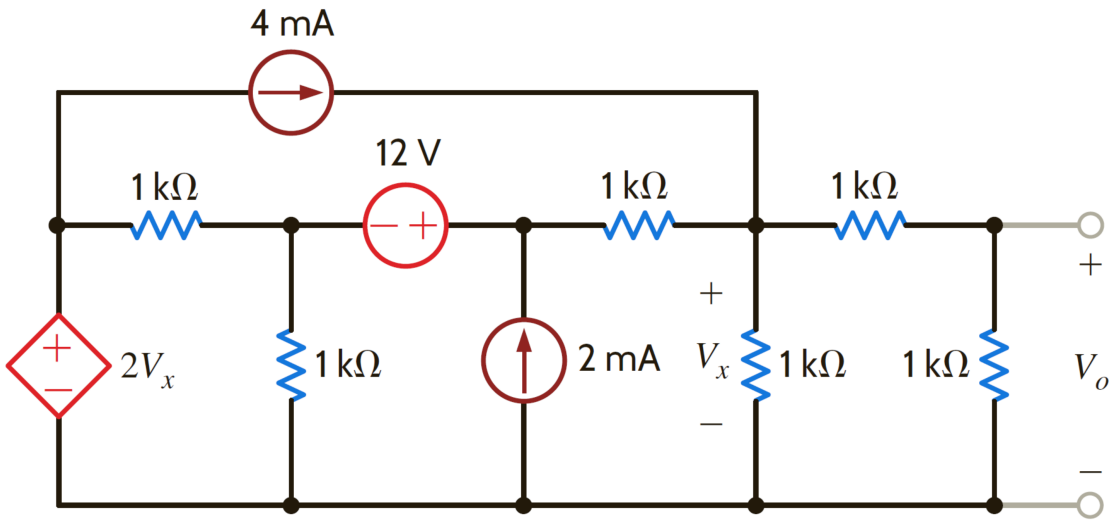
**Problem 6** (10 marks)

For the circuit given below, find the Thevenin equivalent network across the terminals A and B.



**Problem 7** (16 marks)

Find $V_o$ in the circuit given below using Thevenin theorem.



**Problem 8** (12 marks)

For the circuit given below, find the value of the load resistance $R_L$ for which the maximum power is transferred to the load resistance in the circuit.