BRAC University

Semester: Summer 22
Course No: CSE250
Course Title: CIRCUITS AND ELECTRONICS
Section: 19

Mid Assignment
Full Marks: 90
Release date: 28 June, 2022
Deadline: 17 July, 2022

Instructions

- This assignment contains 12 questions on various topics. You must respond to **9** of the 12 questions (see the section heading for instruction of how many to answer from each section).

- Each question is worth ten marks.

- Make an effort to solve and comprehend them.

- Turn in the hard copy of the assignment by 4:59 PM on July 17, 2022.

- Your cover page must include your name, ID, course code, section, and submission date.

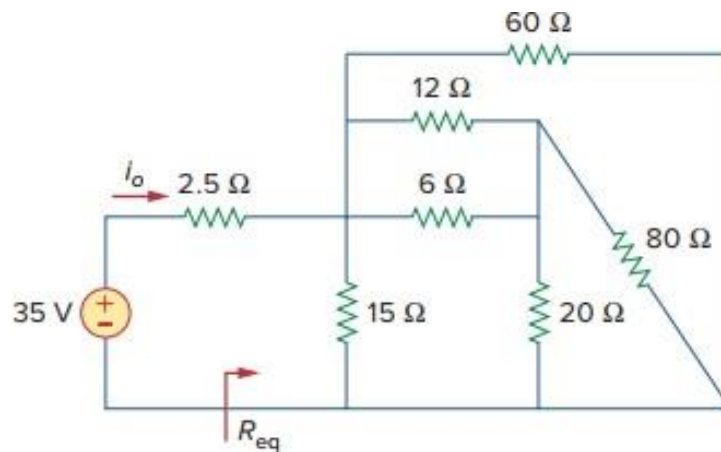- Any form of copying will result in severe penalties. Best wishes.

Questions

Series–Parallel Configuration *(Question 1 and 2 are mandatory)*
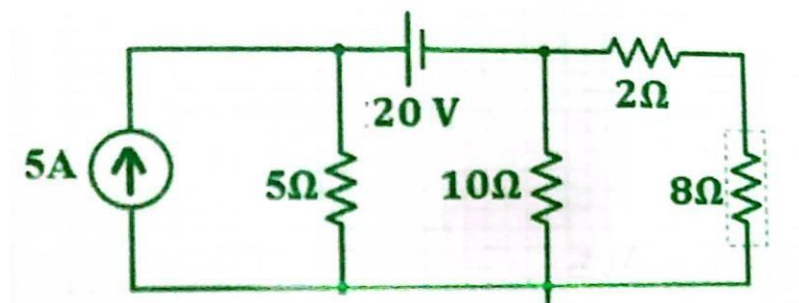
1. Determine R_{eq} looking into the terminals.

3 kΩ

2 kΩ   6 kΩ

6 kΩ
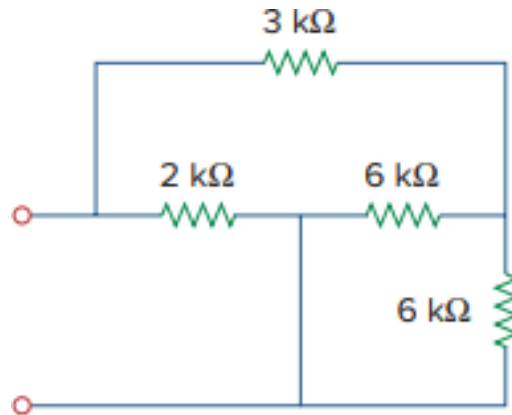
2. Find R_{eq} and i_o for the following circuit.

60 Ω

12 Ω

I_o 2.5 Ω   6 Ω

80 Ω

35 V   15 Ω   20 Ω

R_{eq}

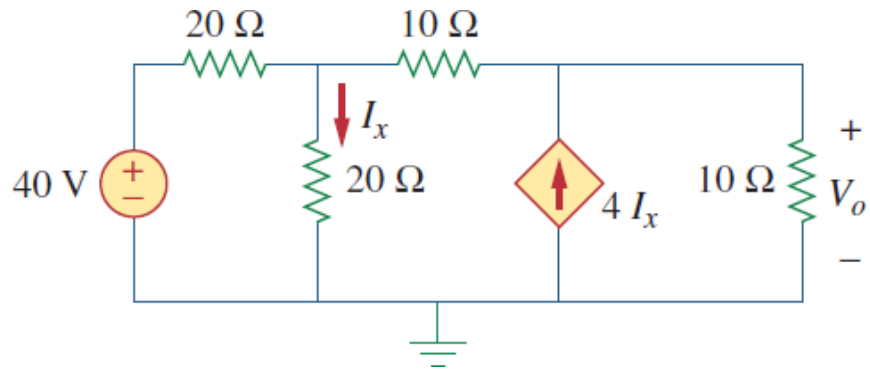**Nodal Analysis** *(For questions 3–6, answer any 3)*
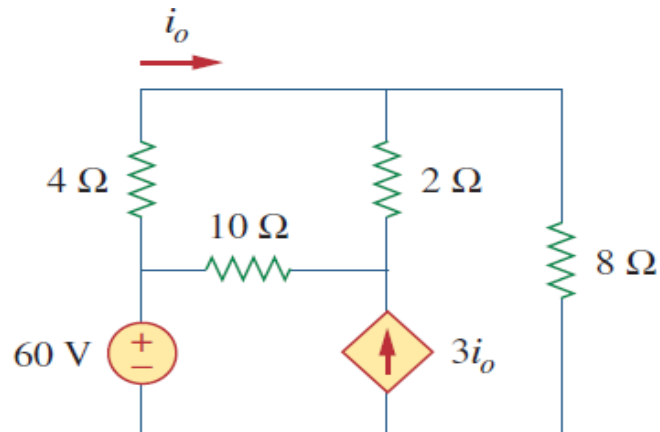
3. Find voltage across the 5A current source using nodal analysis

20 V   2Ω

5A   5Ω   10Ω   8Ω
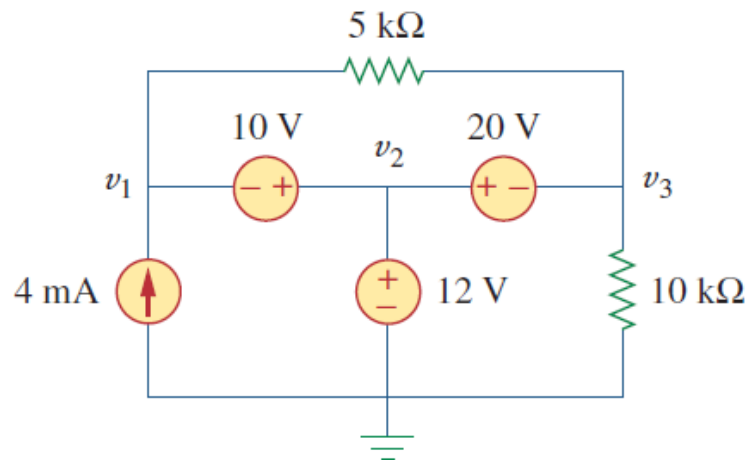
4. Using nodal analysis, determine V_o in the circuit below:

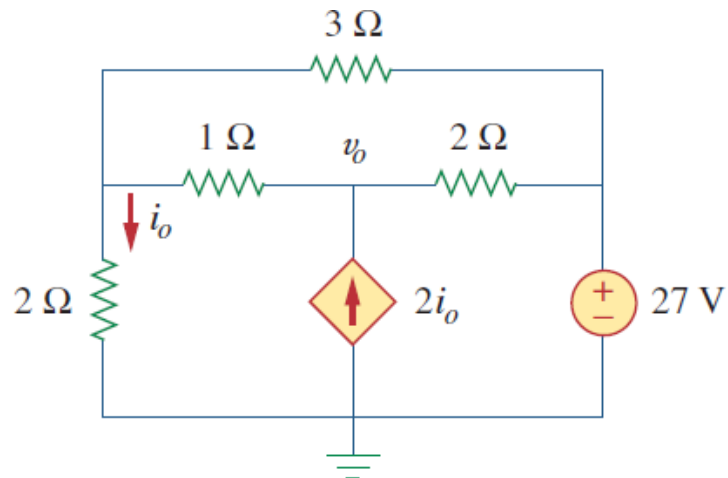5. Using nodal analysis, find current i_o in the circuit given below:

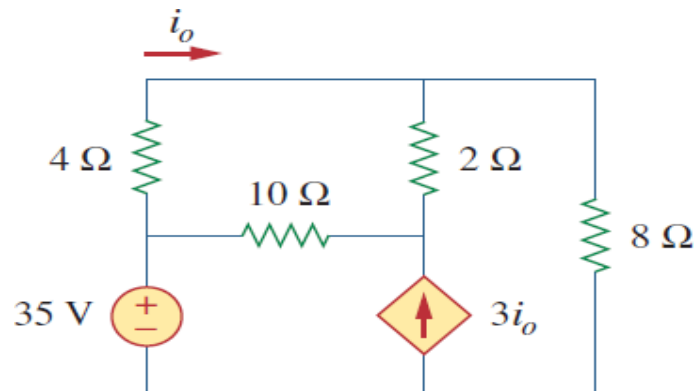

6. Obtain the node voltages from the circuit shown below:

Mesh Analysis *(For questions 7–9, answer any 2)*
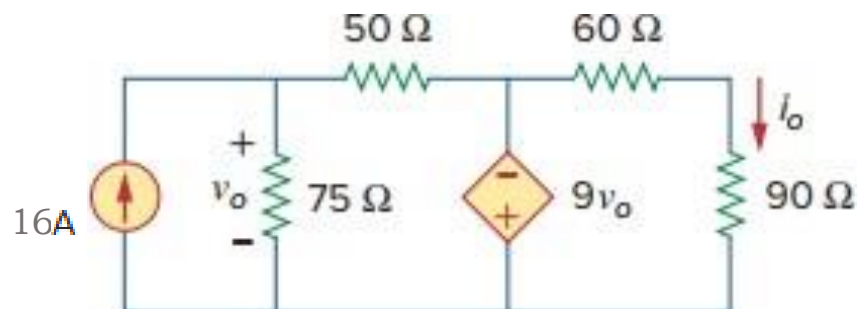
7. Find v_0 and i_0 in the circuit shown below:

$3\,\Omega$

$1\,\Omega$ v_0 $2\,\Omega$

i_0

$2\,\Omega$ $2i_0$ $27\,V$

8. Use mesh analysis to find the current i_0 in the circuit given below:

i_0

$4\,\Omega$ $2\,\Omega$

$10\,\Omega$

$8\,\Omega$

$35\,V$ $3i_0$

9. Find v_0 using mesh analysis.

$50\,\Omega$ $60\,\Omega$

i_0

$16A$ v_0 $75\,\Omega$ $9v_0$ $90\,\Omega$
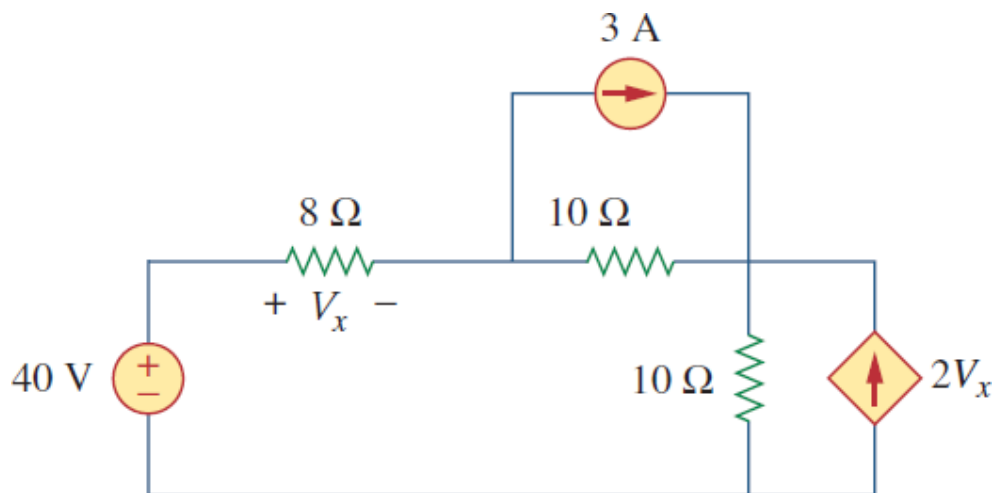
Source Transformation *(For questions 10–12, answer any 2)*

10. Use source transformation to reduce the circuit in the figure below to a single voltage source in series with a single resistor.
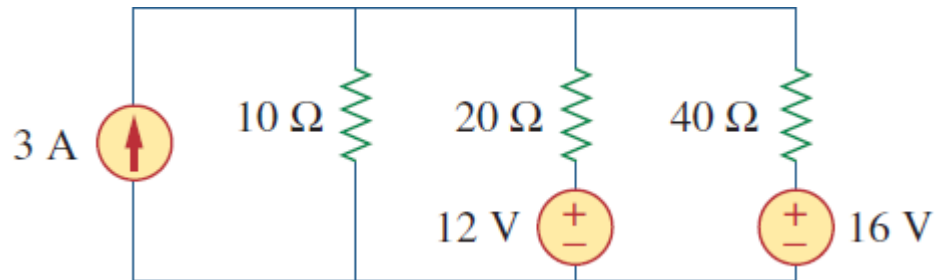
11. Use source transformation to find the voltage V_x in the circuit below.

12. Obtain v_o in the circuit shown below using source transformation.