Brac University
Semester: Spring 2023
Course Code: CSE250
Circuits And Electronics
Section: 05
Faculty: SHS

Set

A

Assessment: *Quiz 1*
Duration: 30 minutes
Date: February 6, 2023
Full Marks (incl. bonus 0): 20

✓ No washroom breaks. Phones must be turned off. Using/carrying any notes during the exam is not allowed.
✓ At the end of the exam, both the **answer script** and the **question paper** must be returned to invigilator.
✓ All **4 questions** are compulsory. Marks allotted for each question are mentioned beside each question.
✓ Bonus questions are indicated as "*(bonus)*" along with allotted marks.
✓ Write your answers inside the indicated boxes. In case you run out of room for an answer, please continue on the back of the page.
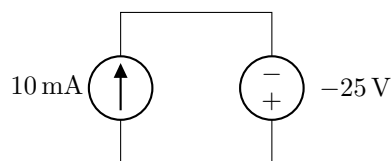

■ Question 1 of 4 *[CO1] [2 marks]*
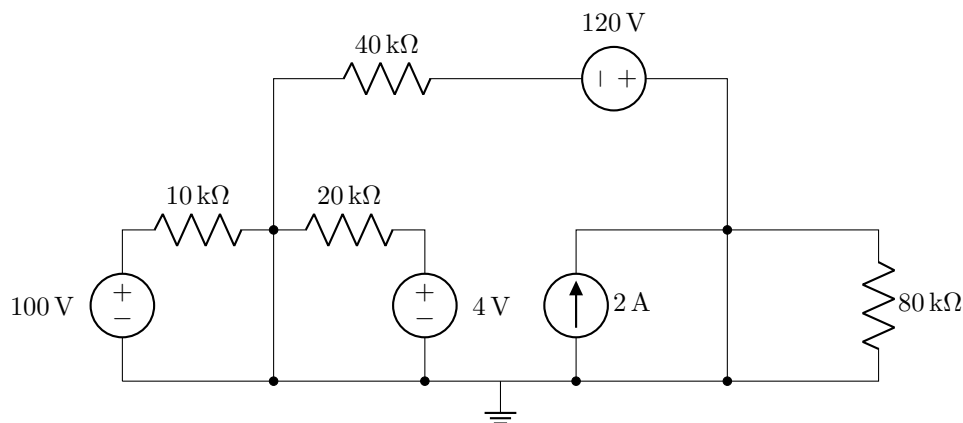
How many nodes are there in this circuit (including the ground node)?

Solution: 4 nodes

■ Question 2 of 4 *[CO2] [6 marks]*

(a) *[2 marks]* What is the power of the current source (with appropriate $\pm$ sign and unit)?[†]

Solution: -250 mW

(b) *[1 mark]* Based on your answer in (a), is the current source supplying/consuming power?

Solution: Supplying

(c) *[2 marks]* What is the power of the voltage source (with appropriate $\pm$ sign and unit)?[†]

Solution: +250 mW

(d) *[1 mark]* Based on your answer in (c), is the voltage source supplying/consuming power?

Solution: Consuming

[†]Mark distribution: 1 mark for the sign, 0.5 mark for the value and 0.5 mark for the unit

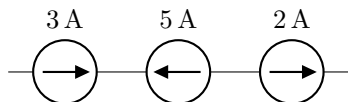# ■ Question 3 of 4 *[CO2] [2 marks]*

Which of the following circuits are illegal connection? For each of the circuits below, put a checkmark (✓) on either "Legal" or "Illegal". Explain why in each case.

(a) *[½ mark]* The following connection is: ✓ **Legal**   ◯ Illegal
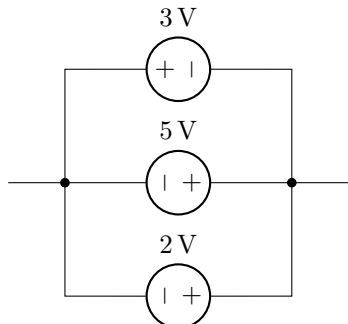
3 V   **5 V**   **2 V**
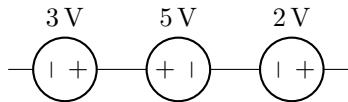
> **Solution:** Because voltage sources can be connected in series.

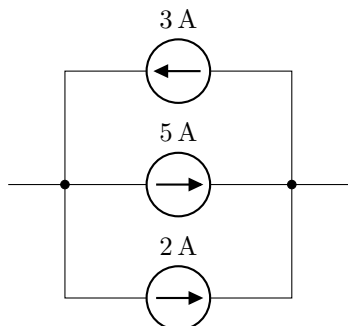(b) *[½ mark]* The following connection is: ◯ Legal   ✓ **Illegal**

> **Solution:** Because current sources can **not** be connected in series.

3 A   **5 A**   **2 A**

(c) *[½ mark]* The following connection is: ◯ Legal   ✓ **Illegal**

3 V

5 V

2 V

> **Solution:** Because voltage sources can **not** be connected in parallel.

(d) *[½ mark]* The following connection is: ✓ **Legal**   ◯ Illegal

3 A

5 A

2 A

> **Solution:** Because current sources can be connected in parallel.

■ Question 4 of 4 *[CO3] [10 marks]*

What is the value of equivalent resistance R_{eq}? *[Must show step by step procedure of finding R_{eq}]*

Solution: $50\,\text{k}\Omega$