ID:	Name:

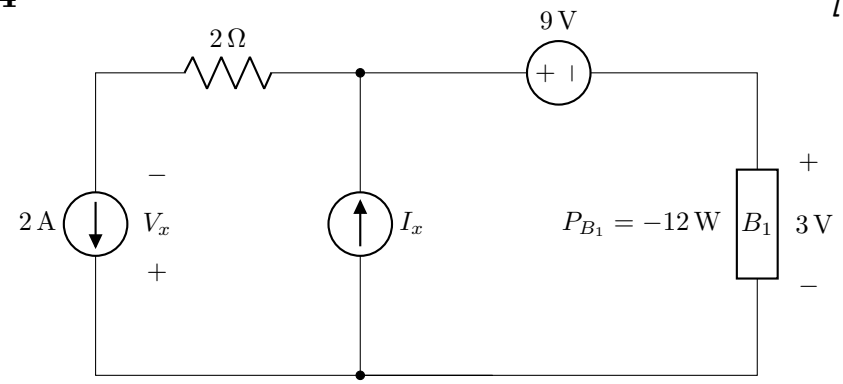
Set **B**

Brac University
Semester: Spring 2025
Course Code: CSE250
Circuits and Electronics

Assessment: *Midterm Exam*
Duration: 1 hour 25 minutes
Date: April 10, 2025
Full Marks: 54

- ✓ 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 the invigilator.
- ✓ All **4 questions** are compulsory. Marks allotted for each question are mentioned beside each question.
- ✓ Proper units must be included for all calculated values. Marks will be deducted for missing or incorrect units.
- ✓ Symbols have their usual meanings.

■ Question 1 of 4 *[CO3] [8 marks]*



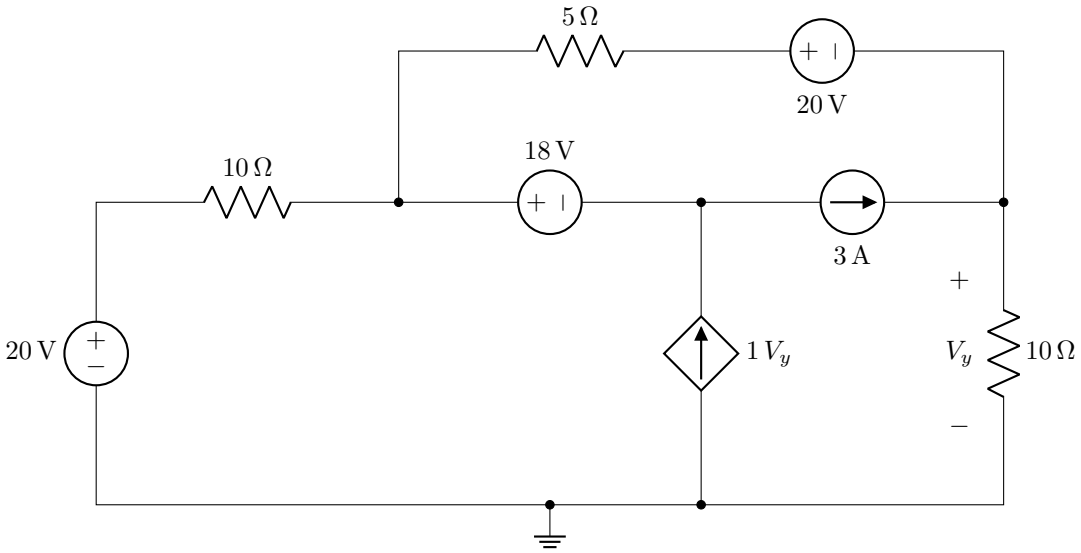
Apply KCL, **KVL**, and **Ohm's Law** to answer the following questions–

(a) ***[3 marks]*** Determine the current through the 9 V voltage source if the power of the element B_1 is -12 W.

(b) ***[3 marks]*** Determine I_x.

(c) ***[2 marks]*** Determine V_x, the voltage across the 2 A current source.

■ Question 2 of 4 *[CO3] [24 marks]*



For the circuit shown above,

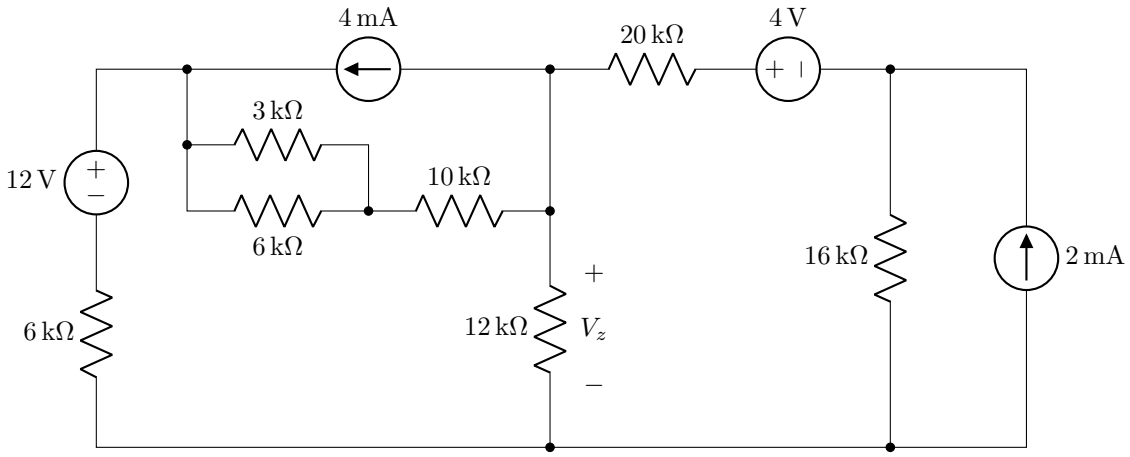
(a) ***[16 marks]*** **Apply** either **Nodal Analysis** or **Mesh Analysis** to determine the power of (i) the 18 V voltage source and (ii) the 3 A current source with the appropriate ± sign and units.†† Also, mention in each case whether the source is supplying or absorbing power.

(b) ***[8 marks]*** **Apply** the alternative method that you did not use in (a) to formulate all the equations needed to solve the circuit. You do not need to simplify or solve the equations.

††Node voltage or mesh current variables must be labeled on the diagram

■ Question 3 of 4 *[CO2] [14 marks]*

Apply Source Transformation to reduce the following circuit to a single loop and then determine V_z.



■ Question 4 of 4 *[CO3] [8 marks]*

Determine the equivalent resistance between the outermost nodes of the Resistobot's hands, that is, between the circles in the given figure.