Assignment-01 (SPICE coding)

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Contents

All Exercises (Resistor Only)

1. **Ohm's Law Test:** Apply 10V across a 1kΩ resistor. Calculate current.
2. **Voltage Divider:** Two 1kΩ resistors in series. Measure voltage at the midpoint.
3. **Series Network:** Connect 1k, 2k, and 3k resistors in series. Find the current through the circuit when powered by 12V.
4. **Parallel Combination:** Connect 1kΩ and 2kΩ resistors in parallel. Apply 10V. Measure total current.
5. **Power Dissipation:** Find the power dissipated in a 1kΩ resistor connected to 5V.
6. **Thevenin Equivalent:** Use a 1k and 2k series divider. Measure open-circuit voltage at the midpoint.
7. **Parameter Sweep:** Sweep a resistor from 1k to 5k and observe output voltage in a voltage divider configuration.
8. **Norton Equivalent:** Add a 1mΩ resistor to short a voltage divider. Measure short-circuit current.
9. **Wheatstone Bridge:** Construct a balanced Wheatstone bridge using four 1k resistors. Measure bridge voltage.
10. **Temperature Coefficient:** Simulate the effect of temperature on a 1k resistor with a TC of 0.004. Sweep temperature from 25°C to 100°C.