

EXPERIMENT # 3

COMPUTER SIMULATION OF A D.C. CIRCUIT

OBJECTIVE:

- 1- To simulate a D.C. circuit on a computer using a Pspice.
- 2- To experimentally verify the computer simulation.

Pre- Lab Assignment:

- 1- Find the variables indicated in the circuit of Figure 1.
- 2- Summarize your results in Table 2 & Table 3.

APPARATUS: One Personal Computer with PSPICE installed in it.
Digital Multimeter
D.C. Power supply (Two)
Resistors: 10 K Ω , 22 K Ω , 33 K Ω , and 47 k Ω (Two)

THEORY:

The variables indicated in the circuit of Figure 1 can be solved by using Ohm's Law, KCL and/or KVL. These variables can also be obtained by a computer simulation program known as PSPICE.

Procedure:

1. Simulate the circuit shown in Figure 1 using PSPICE.
2. Summarize your results in table 2.
3. Attach to the report of this experiment a printout of the results you obtained from the PC lab.

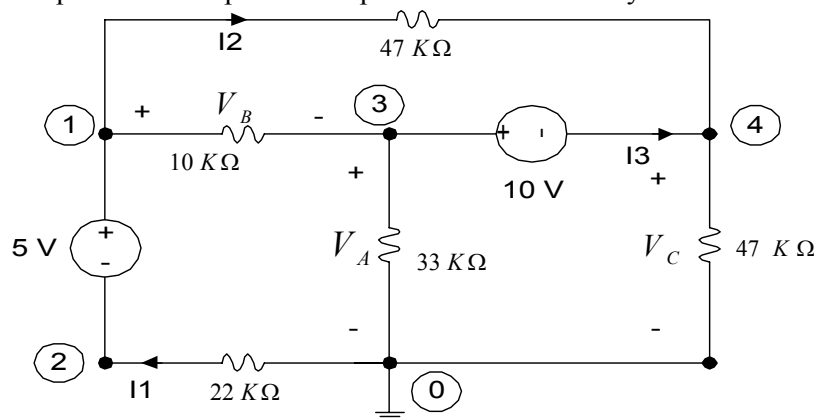


Figure 1

4. Connect the circuit shown in Figure 1.
5. Measure the resistor values with an Ohmmeter. Complete Table 1.
6. Measure all the variables indicated in this circuit. Summarize the results in Table 3.

Report:

Compare the computer results and the experimental results. Calculate the percentage error.

Questions:

- 1- Which method is better and why?
- 2- Does a computer simulation represent actual circuit behavior? Discuss the point by referring to the results you obtained in this experiment.

TABLE 1

Resistors Values:

Resistor	R1	R2	R3	R4	R5
Nominal value (Ohm)	10 K Ω	22 K Ω	33 K Ω	47 K Ω	47 K Ω
Ohmmeter reading					

TABLE 2

Results For Circuit Of Figure 1 Using PSPICE:

Variable	I ₁	I ₂	I ₃	V _A	V _B	V _C
Calculation						
Computer Simulation						
% Error						

TABLE 3

Results For Circuit Of Figure 1 Experimentally:

Variable	I ₁	I ₂	I ₃	V _A	V _B	V _C
Calculation						
Experimental Results						
% Error						