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Circuit Theory and Electronics Fundamentals

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Laboratory Report 1

March 22, 2021

Contents

1 Introduction

The objective of this laboratory assignment is to do analysis on a circuit using the mesh and the nodal method as well as running a simulation using NGspice with the objective of detecting small diferences between the different studies and understand why said differences happens. The circuit can be seen in Figure 1.

In Section 2, a theoretical analysis of the circuit is presented. In Section 3, the circuit is analysed by simulation, and the results are compared to the theoretical results obtained in Section 2. The conclusions of this study are outlined in Section 4.

2 Theoretical Analysis

TO BE DONE

3 Simulation Analysis

3.1 Operating Point Analysis

Table 1 shows the simulated operating point results for the circuit under analysis. Compared to the theoretical analysis results, one notices the following differences: describe and explain the differences.

TO BE DONE

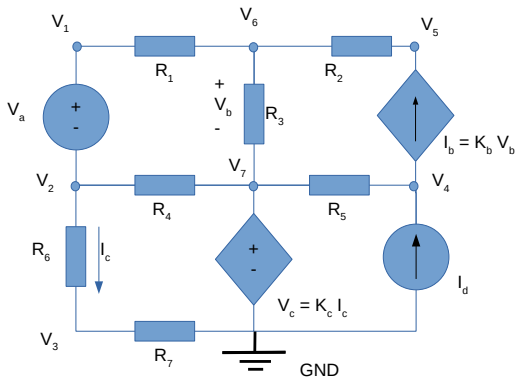

Figure 1: Circuit with an independent current and voltage source (V_a and I_d respectively) and linear dependent sources (V_c-linear current controlled voltage source and I_b-linear voltage controlled current source

4 Conclusion

TO BE DONE

Name	Value [A or V]
@cb[i]	0.000000e+00
@ce[i]	0.000000e+00
@q1[ib]	7.022567e-05
@q1[ic]	1.404513e-02
@q1[ie]	-1.41154e-02
@q1[is]	5.765392e-12
@rc[i]	1.411536e-02
@re[i]	1.411536e-02
@rf[i]	7.022567e-05
@rs[i]	0.000000e+00
v(1)	0.000000e+00
v(2)	0.000000e+00
base	2.254108e+00
coll	5.765392e+00
emit	1.411536e+00
vcc	1.000000e+01

Table 1: Operating point. A variable preceded by @ is of type *current* and expressed in Ampere; other variables are of type *voltage* and expressed in Volt.