Applications of Mathematics in Circuit Theory

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Abstract - Application of Gaussian in circuit theory, using Kirchhoff's 2⁻¹ law. In this paper for a given circuit, forming into matrices form by using Kirchhoff's 2⁻¹ law we solve and find the current values. Less than 3x3 matrices we can use Carmel's rule, but more that 3x3, Carmel's cannot be done, so gauss elimination method is used to find the current values for the given circuits.

I. CIRCUITS

An electronic circuit is composed of individual electronic components like Transistors, Capacitors, Inductors and Diodes, Resistors connected by conductive wires or traces through which Electric Current can flow. The combination of components and wires allows various simple and complex operations to be performed signals can be amplified, computations can be performed, and data can be moved from one place to another Circuits can be constructed of discrete components connected by individual pieces of wire

Let R = Resistance of the circuit
C = Capacitance in series with R
I = Current flowing
L = Inductor
V = voltage across R
R
Vc = voltage across C
V = voltage across L
L

II. OHM'S LAW

Ohm's law defines a linear relationship between the voltage and the current in an electrical circuit. The DC current flow through a resistor is set by the resistor's voltage drop and the resistor's resistance.

Ohm's Law Formula / Equation

When we know the voltage and resistance, we can calculate the corrent.

Other's law definition

The resistor's current I in amps (A) is equal to the resistor's voltage $V_R^{-\alpha V}$ in volts (V) divided by the resistance R in ohms

(\$20):

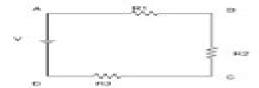


In 1845, a German physicist, Gustav Kirchhoff developed a pair or set of rules or laws which deal with the conservation of current and energy within electrical circuits. Application of Gauss Elimination in circuits

III. KIRCHHOFF * S 2 LAW

In a closed circuit the sum of the potential drops is equal to the sum of the potential rises.

In the closed loop ABCDA,



Brench	Potential drop	Potential rise
AB	IR,	-
BC	IR.	
CD	IR,	1
DA	- <u> </u>	v

[Note: When we go from D to A (from the negative terminal to the positive terminal of the battery) There is a potential rise of V volts.

Assume the loop current to be I_1, I_2 and I_3 as shown in the

figure, all clockwise. The currents through R_A , R_B , R_B see -1_1 , 1_2 , 1_3

respectively.

The current through R_B is $I_1 - I_2 & \text{through } R_D$ is $I_2 - I_3$.

Brench	Potential rise	Potential drop	
PQ	I,RA		-
QV	(I,-I,) R,	в —	
WP	<u>-</u> -	v _	

Mathematics For Electrical Circuit Analy

David Baud

Mathematics For Electrical Circuit Analy:

Mathematics For Electrical Circuit Analy Book Review: Unveiling the Magic of Language

In a digital era where connections and knowledge reign supreme, the enchanting power of language has be apparent than ever. Its capability to stir emotions, provoke thought, and instigate transformation is actually remarkable. This extraordinary book, aptly titled "Mathematics For Electrical Circuit Analy," published by a highly acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound impact on our existence. Throughout this critique, we shall delve to the book is central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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