ELEC 4700 Assignment 4

Circuit Modeling

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Chad Blanchette 100968854

Part 1:

The code from this part was pulled from my PA 9 work which formulated the MNA equations to solve the nodal voltages and currents. The following 4 figures are plots from PA 9.

A screenshot of a social media post

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Figure 1: Voltage Output in DC

A screenshot of a social media post

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Figure 2: Output Voltage in AC

A screenshot of a cell phone

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G and C matrices

A picture containing screenshot

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Figure 3: Voltage Gain compared to Frequency

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Figure 4: Histogram of Voltage Gain

Part 2:

The following figures will show the effects of a transient system compared to the original.

A close up of a device

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Figure 5: DC input and AC output

A screenshot of a cell phone

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Figure 6: Vin and Vout with respect to Frequency

A screenshot of a cell phone

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Figure 7: Sine function from part 2d

A screenshot of a social media post

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Figure 8: Sine function at different frequencies

A screenshot of a social media post

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Figure 9: Part 2C Vin and Vout in time domain

A screenshot of a computer

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Figure 10: Fourier Transform of Frequency Response

Part 3

The following figures will show how noise affects the circuit simulations.

A screenshot of a cell phone

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Figure 11: Vout and Vin with noise added to the circuit with time

A screenshot of a social media post

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Figure 12: Vout and Vin with noise added to the circuit with frequency