Laboratory 16: Matlab and Data Analysis
(Edit this document as needed)

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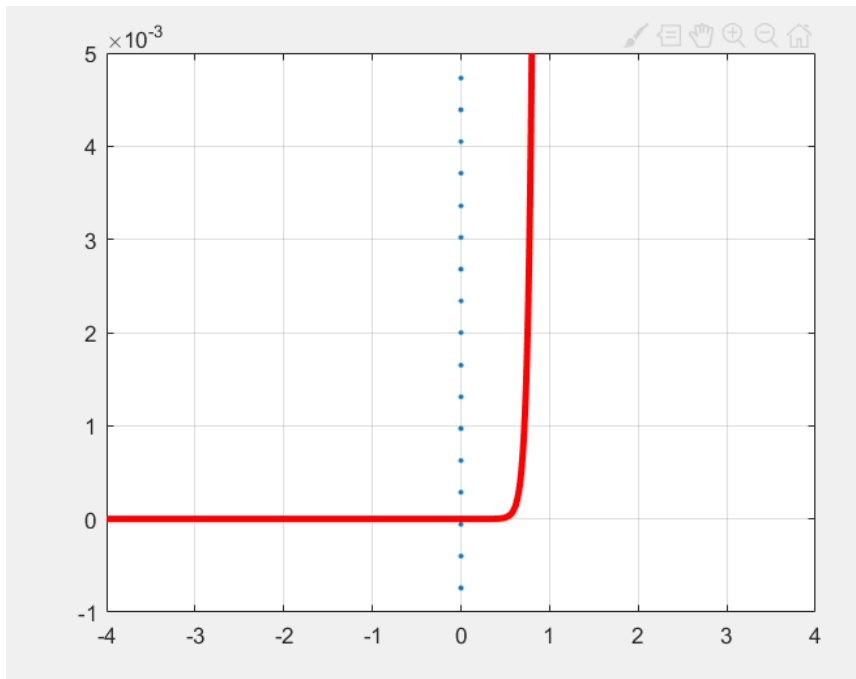
Partner 3: _____ (if needed)

Part A

Brief description of the Matlab diode plotting experiment:

To delve deeper into Matlab's capabilities of plotting and to determine the difference between a standard diode and an ideal diode and the same for an LED.

Plot of the diode current (I_D) vs. the diode voltage (V_D) for a standard diode. (Matlab)
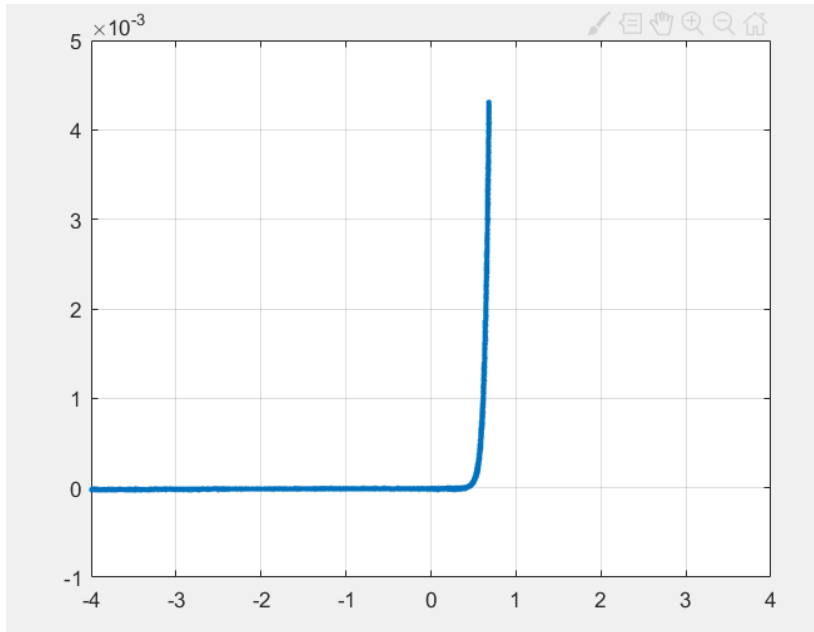

Plot of the experimental I_D-V_D and the calculated ID using $I_D = I_S \left[\exp^{\left(\frac{V_D}{nV_T} \right)} - 1 \right]$ for a
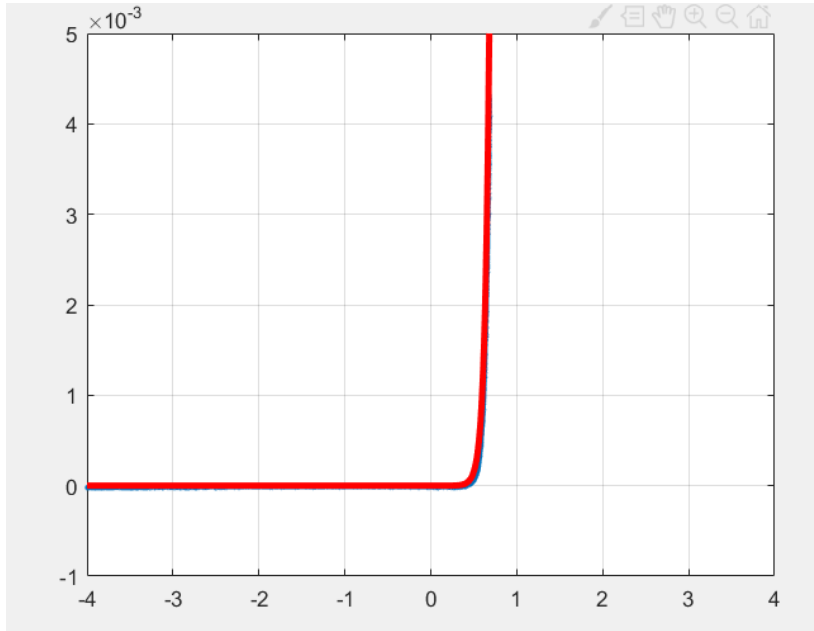
standard diode. (Matlab)
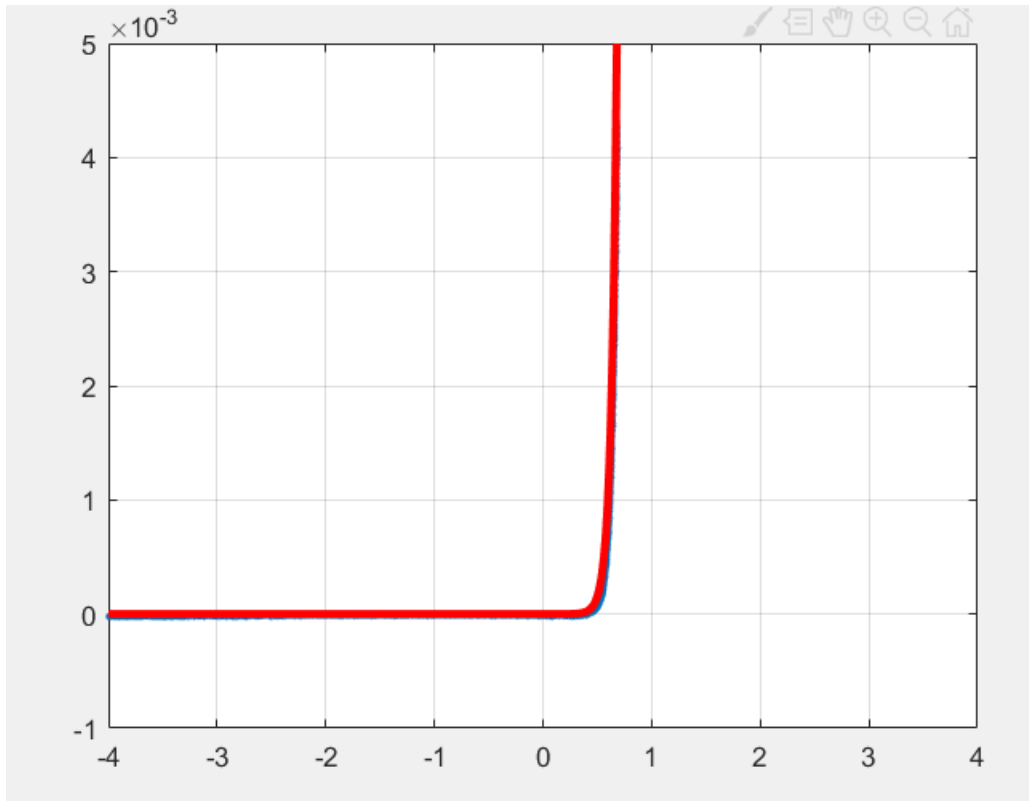
Value of I_S and n in your fitted curve.

I_S	1e-8[A]
n	2

Plot of the diode current (I_D) vs. the diode voltage (V_D) for a LED. (Matlab)

Plot of the experimental I_D-V_D and the calculated ID using $I_D = I_S \left[\exp^{\left(\frac{V_D}{nV_T} \right)} - 1 \right]$ for a

LED. Matlab)

Value of I_S and n in your fitted curve.

I_S	1e-7[A]
n	2

Experimental and analytical plots verification by TA/Instructor. _____HC_____

Part B

Brief description of the Load Line experiment:

To reference the load of a circuit in the form of I=AV+B and to be able to analyze graphically the operational points of circuit components(diodes).

Mathematical expression for the current through the resistor in terms of the source voltage (V_S) and the resistance, R.

$I=(-1/R)V+(V_s/R)$

Plot of load line on the following experimental curve.

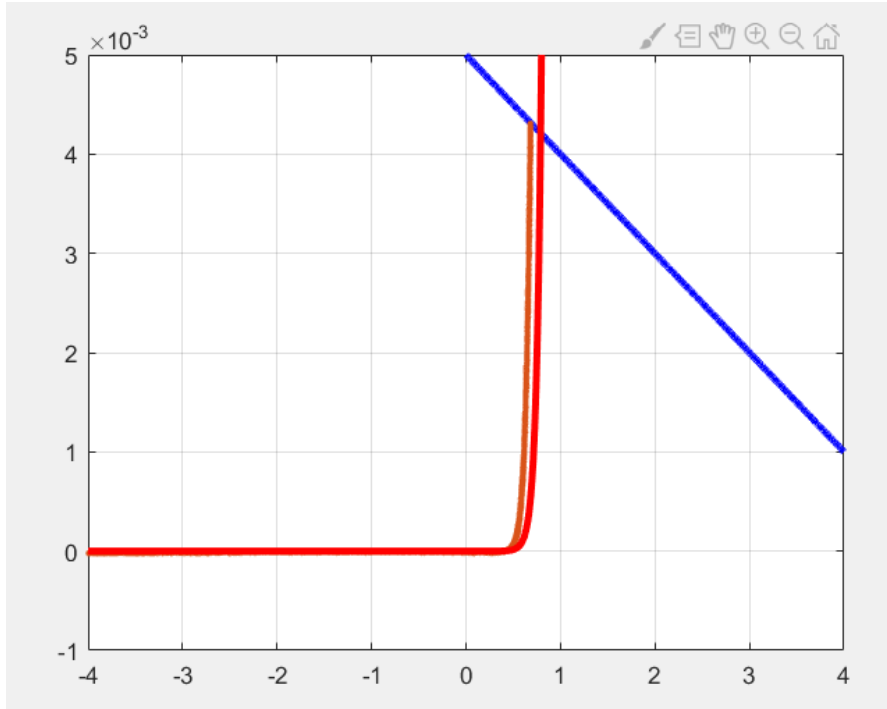Y-intercept 80mA
X-intercept 5V
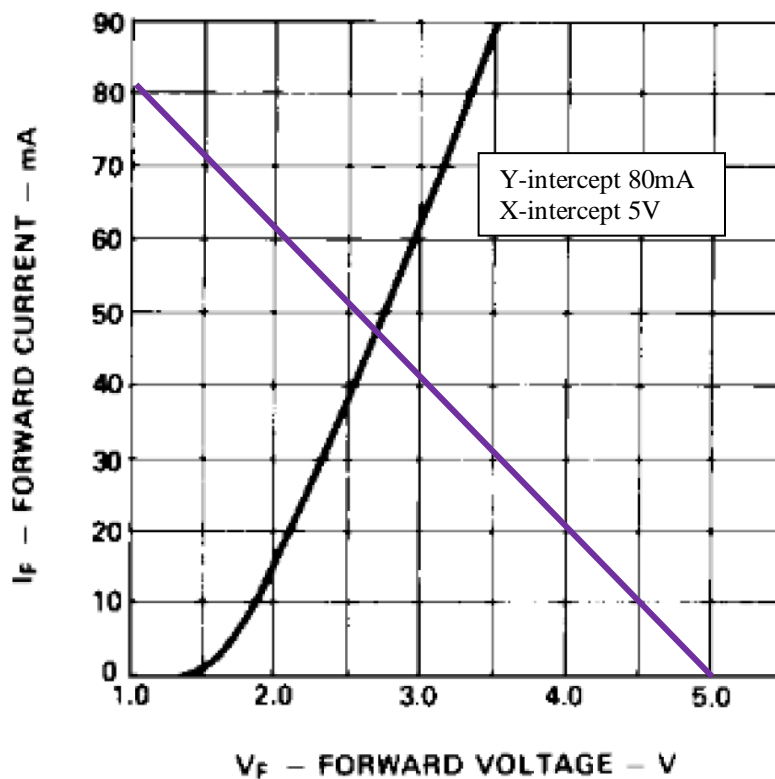
Load line plot verification by TA/Instructor. _____HC_____

Approximate diode (resistor) current and diode voltage using the load line analysis on the above plot.

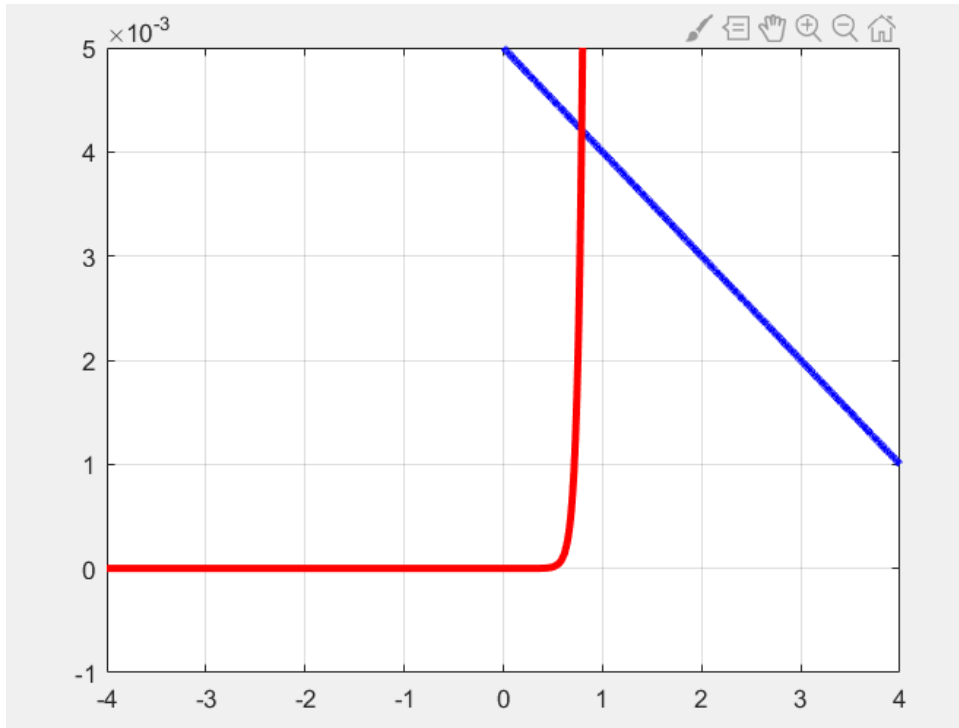| I_D	0.048[A]
V_D	2.7[V]

Plot with load line for standard diode using experimental data from part A.

Approximate diode (resistor) current and diode voltage using the load line analysis on the above plot.

I_D	0.005[A]
V_D	0.67[V]

Plot with load line for LED using experimental data from part A.

Approximate diode (resistor) current and diode voltage using the load line analysis on the above plot.

I_D	0.004[A]
V_D	0.8[V]