Date: 09/08/2021 Exp. 2 Testing and Troubleshooting of Diodes, Zener Diodes and Transistors

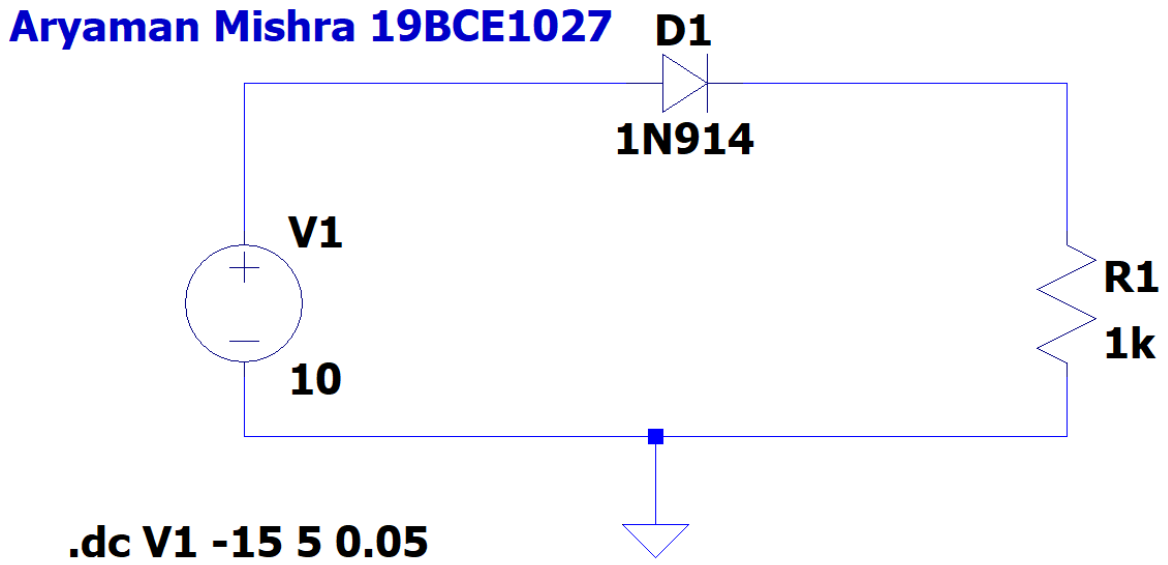
1)

Aim: To learn the testing and trouble shooting of Diodes and to obtain diode characteristics (V-I).

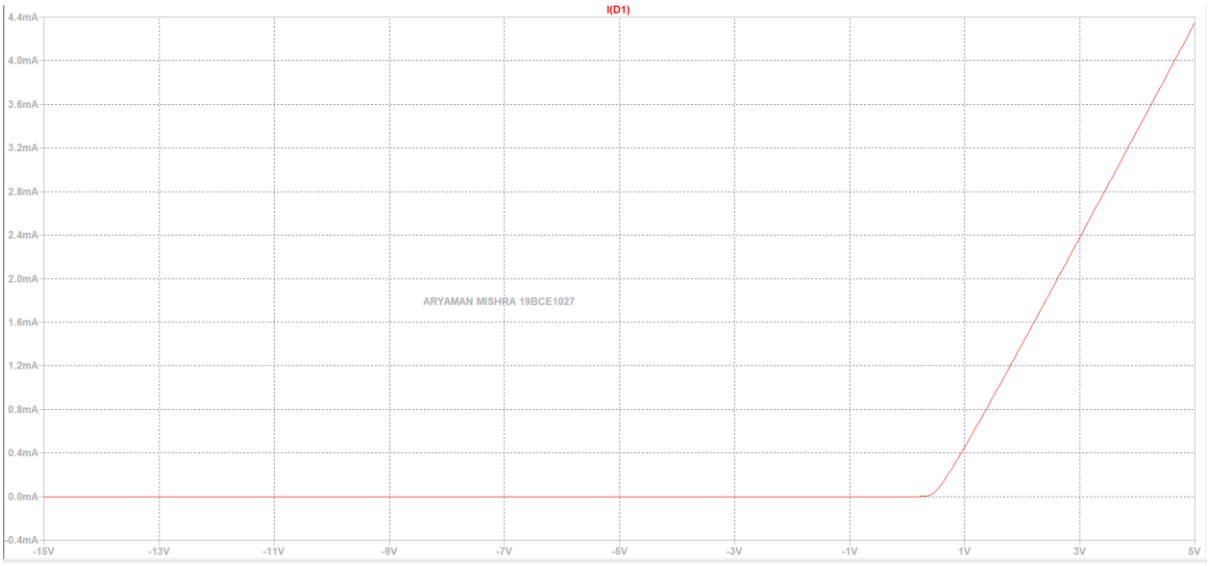
Software/Hardware Components used: LTSpice, 1Resistor, 1 Voltmeter, 1 Diode, Ground, Wire

Circuits and Plots:

Circuit



Plot



INPUTS AND OUTPUTS:

Inputs

Components Used	Input Value
V1	10V
R1	1K Ohm
D1	1N914

Conclusion: Hence we are able to obtain the diode characteristics. (V-I)

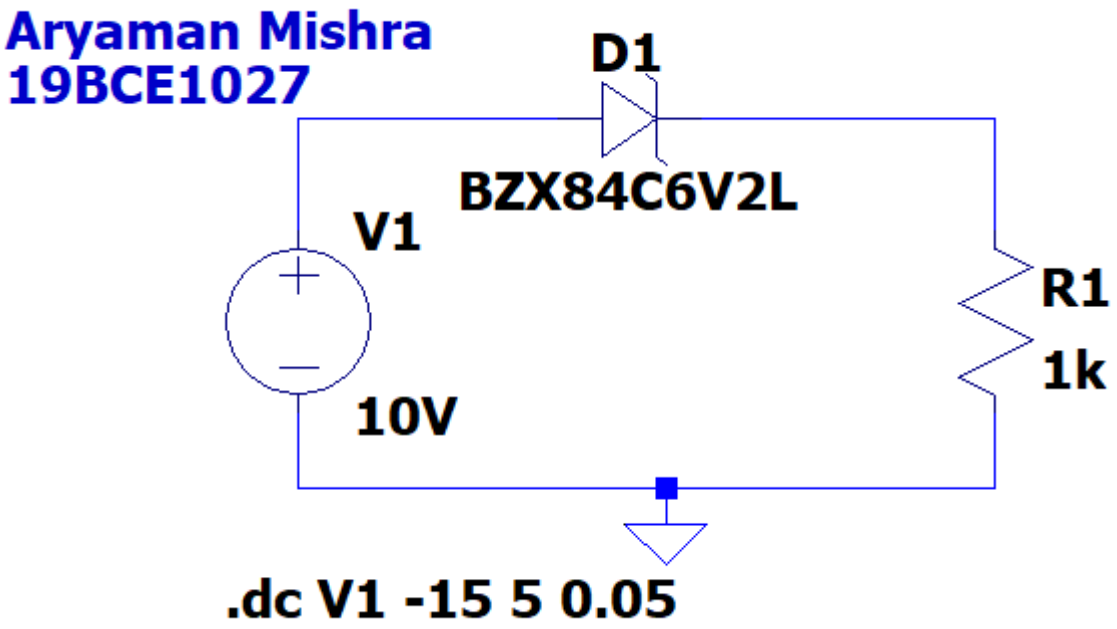
2)

Aim: To learn the testing and trouble shooting of Zener Diodes and to obtain VI characteristics of Zener Diodes (2 diodes).

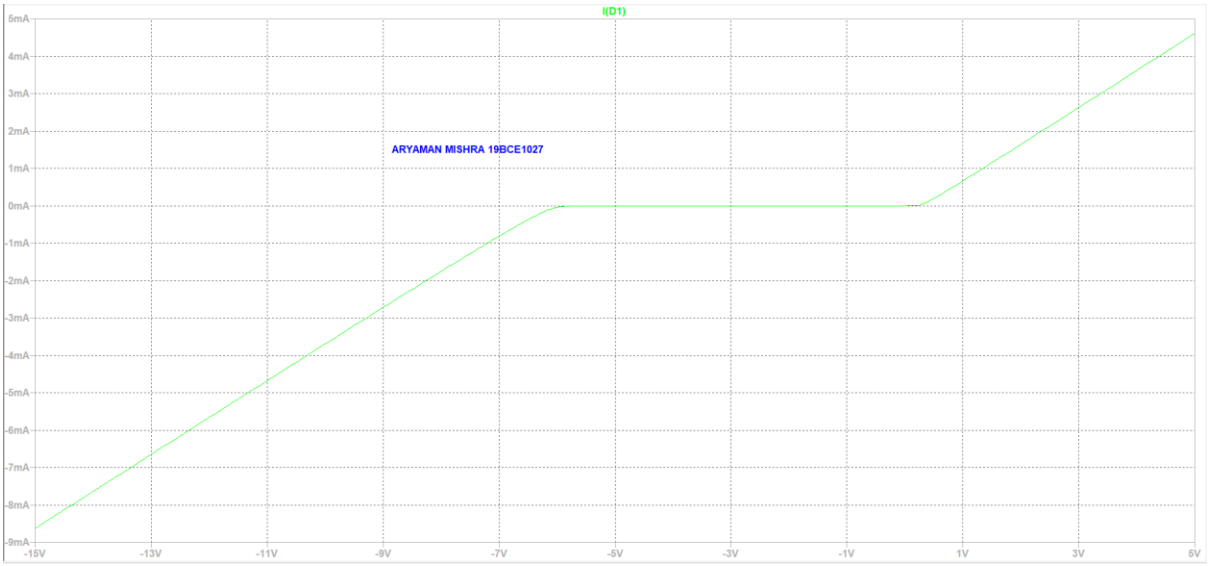
Software/Hardware Components used: LTSpice, 1Resistor, 1 Voltmeter, 2 Diodes, Ground, Wire

Circuits and Plots:

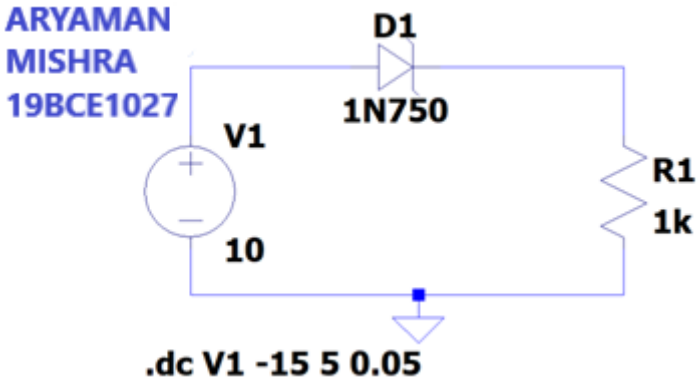
Circuit 1



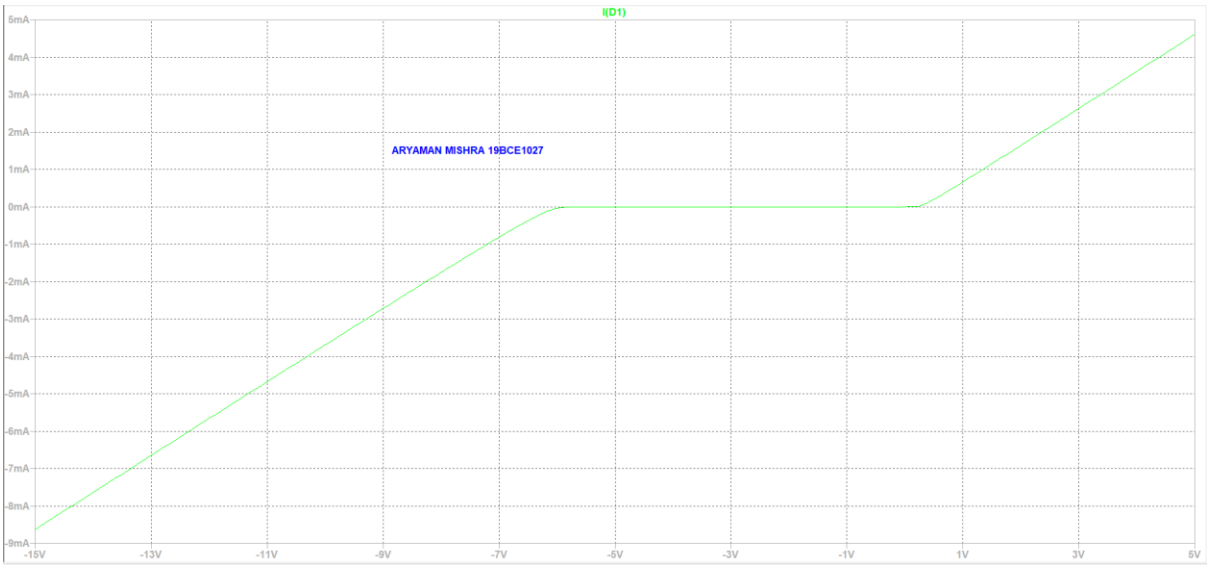
Plot 1



Circuit 2



Plot 2



INPUTS AND OUTPUTS:

Inputs

Components Used	Input Value
V1	10V
R1	1K Ohm
D1	BZX84C6V2L, 1N750

Conclusion: Hence we obtain the VI Characteristics of the zener diode.

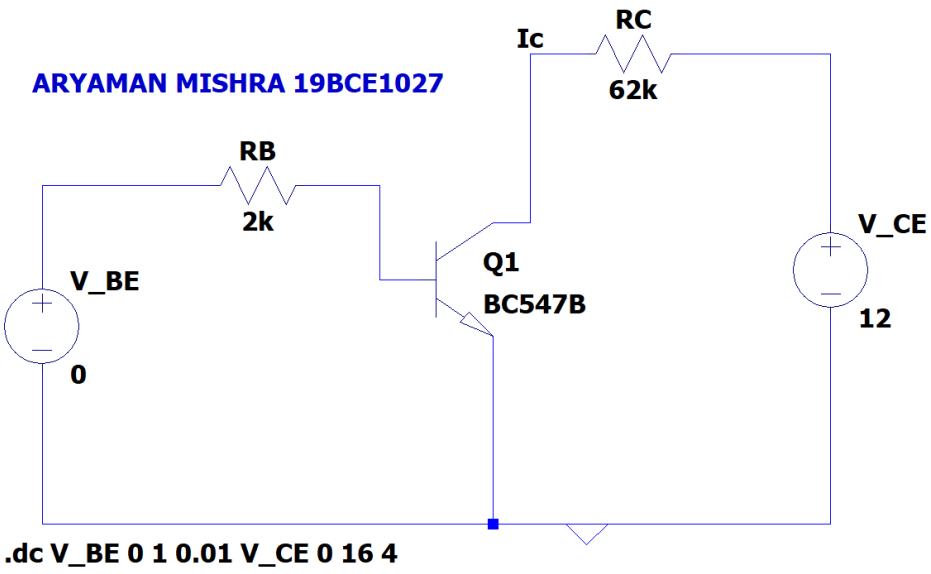
3)

Aim: To learn the testing and trouble shooting of Transistors and obtain Input and output characteristics of NPN Transistor circuit with:
a) CE configuration
b) CB configuration
c) CC configuration

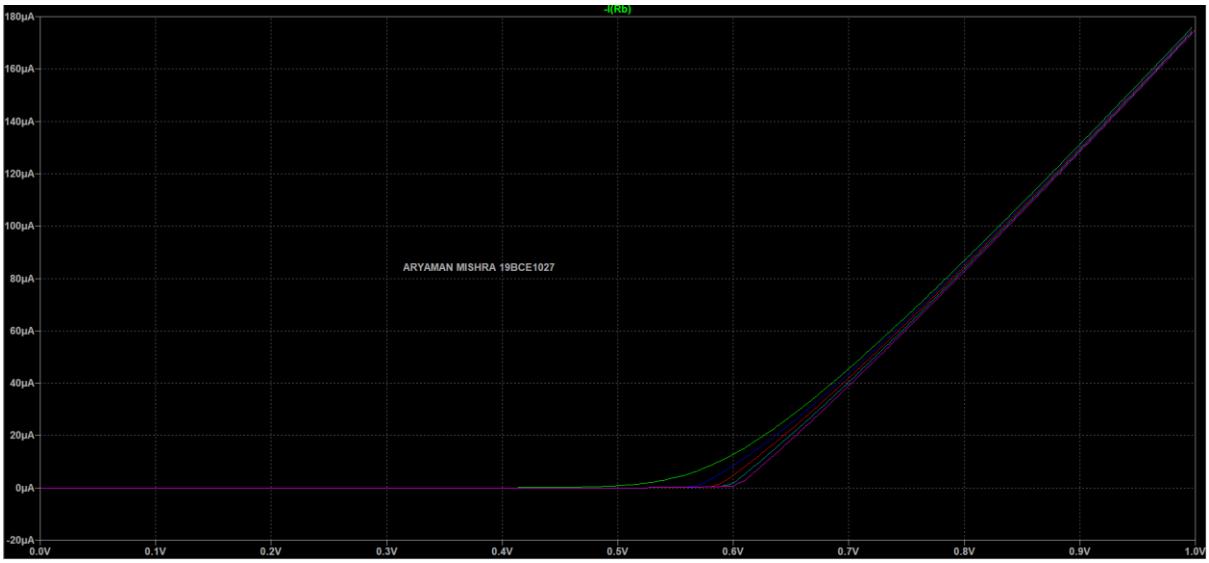
Software/Hardware Components used: LTSpice, 2 Resistors, 2 Voltmeters, 1 Diode, Ground, Wire

Circuits and Plots:

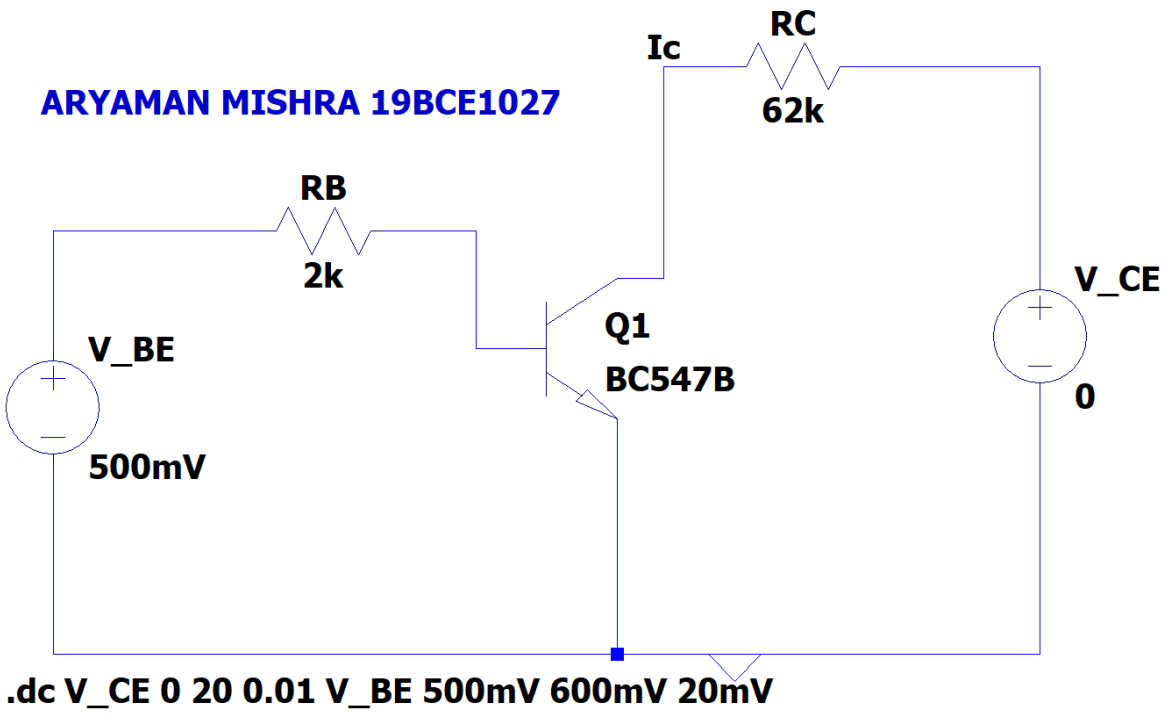
Circuit 1 (Transistor in CE: Input Characteristics)



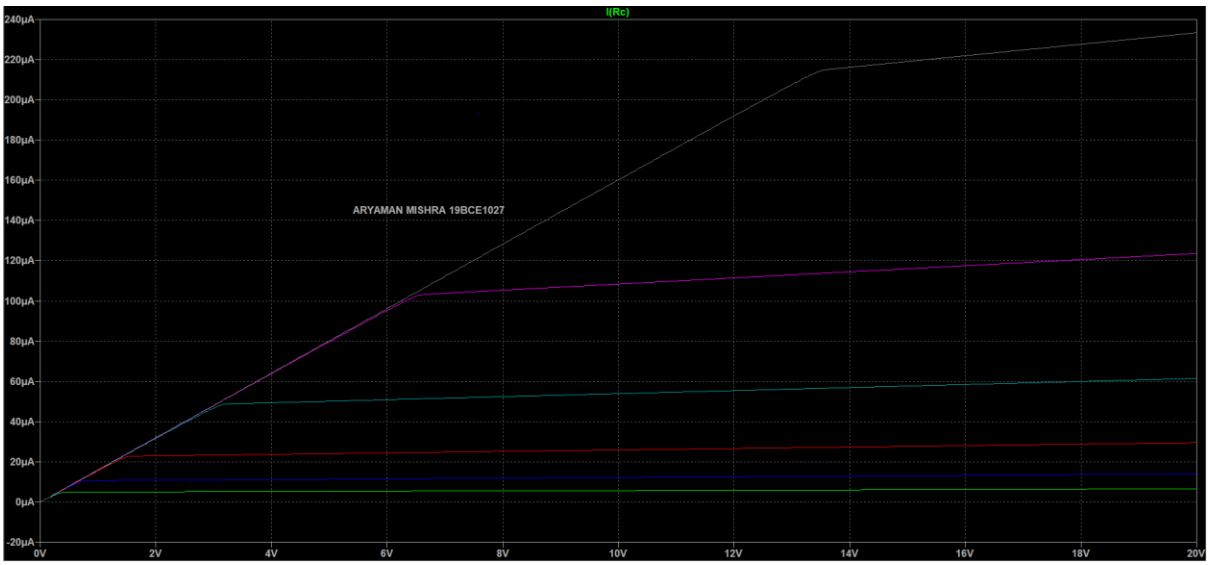
Plot 1 (Transistor in CE: Input Characteristics)



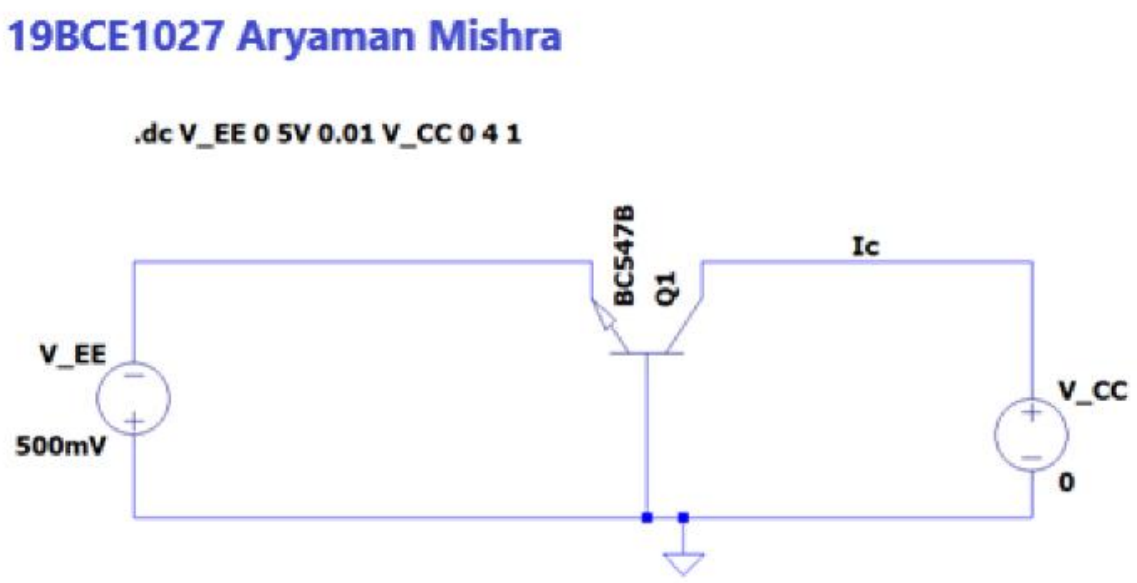
Circuit 2 (Transistor in CE: Output Characteristics)



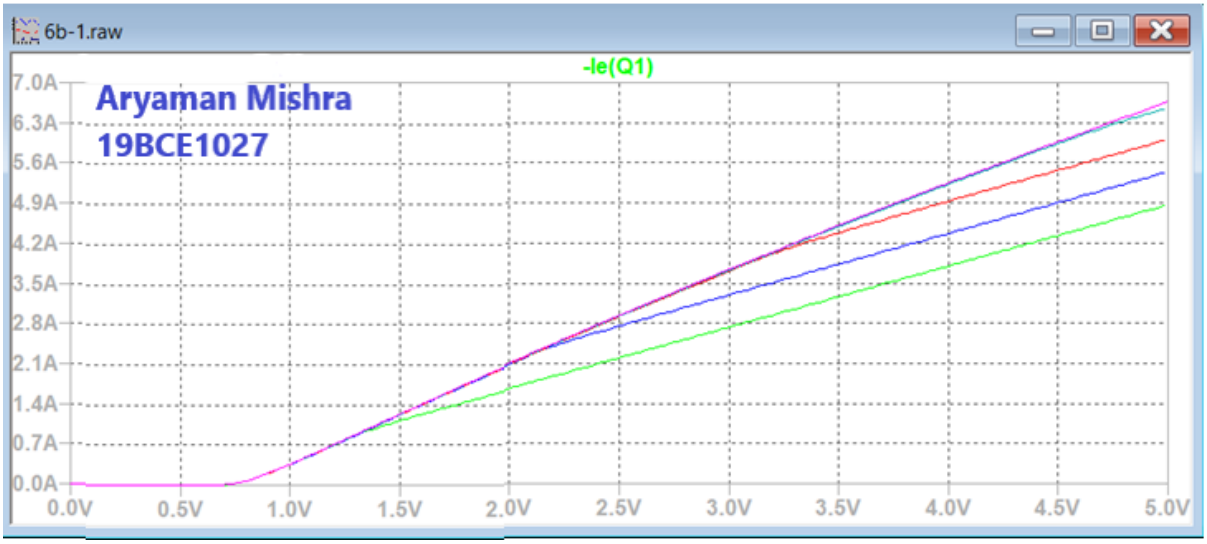
Plot 2 (Transistor in CE: Output Characteristics)



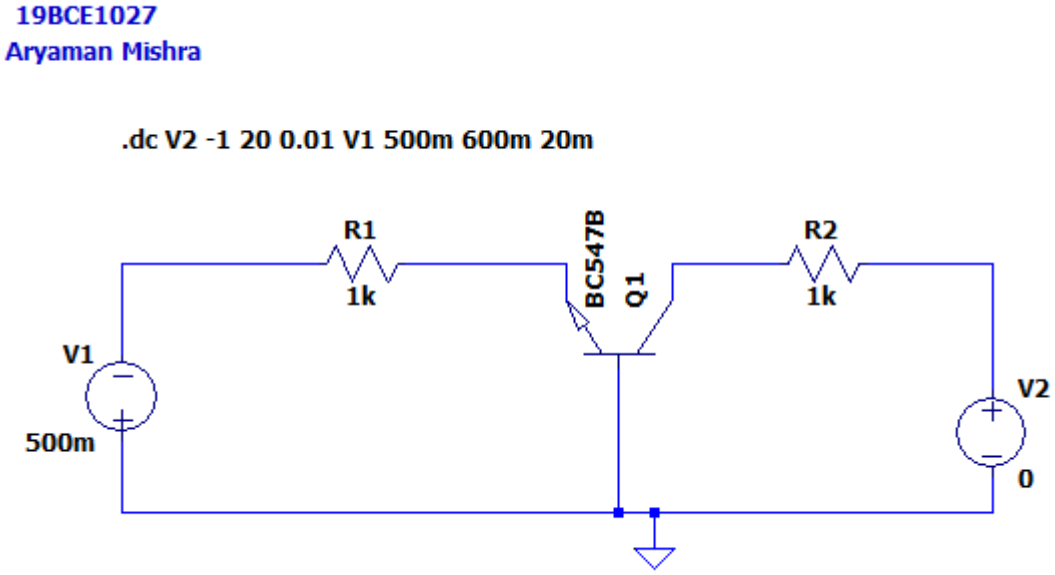
Circuit 3 (Transistor in CB: Input Characteristics)



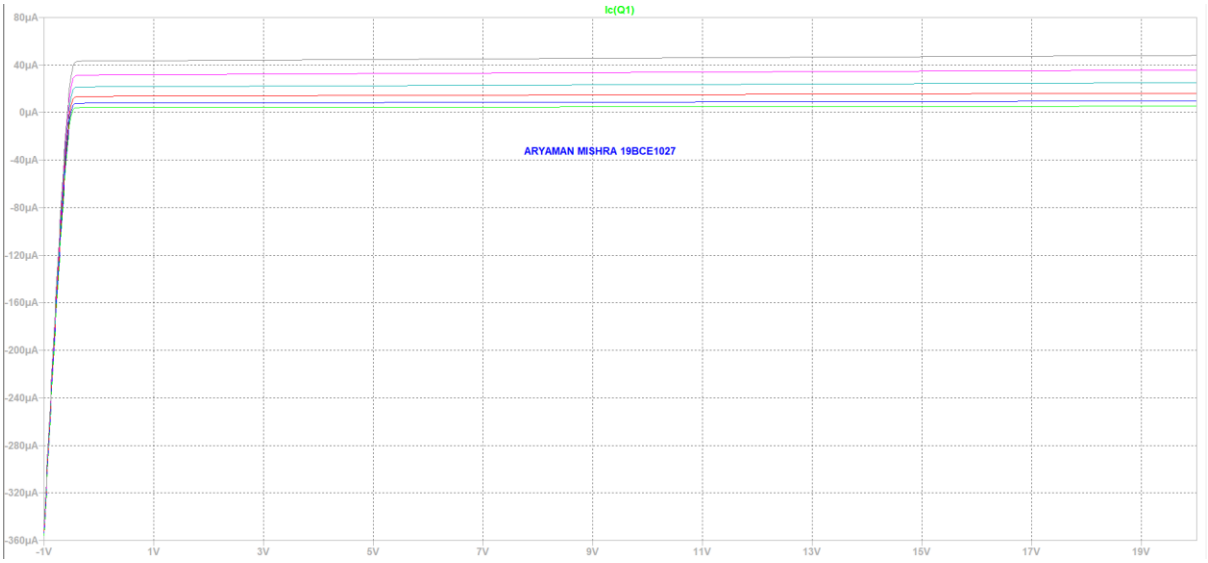
Plot 3 (Transistor in CB: Input Characteristics)



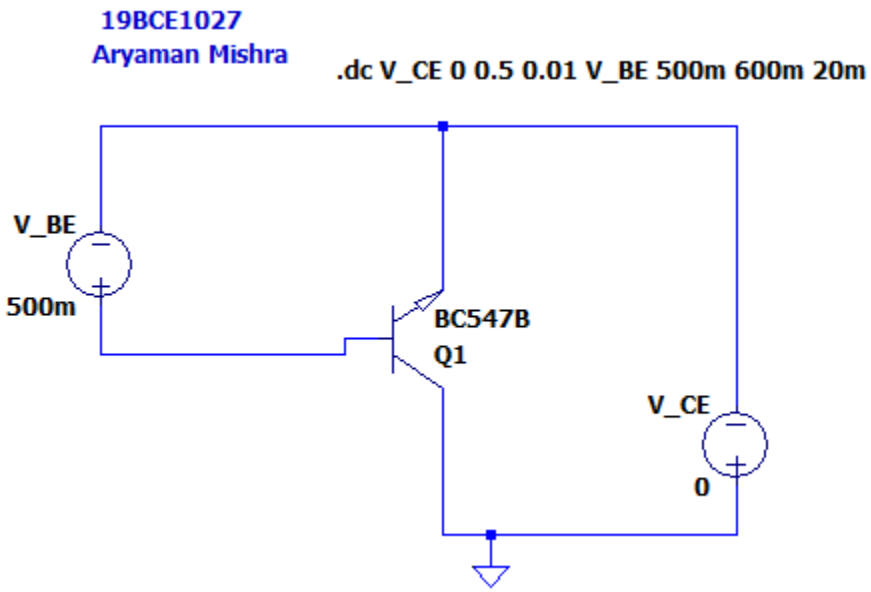
Circuit 4 (Transistor in CB: Output Characteristics)



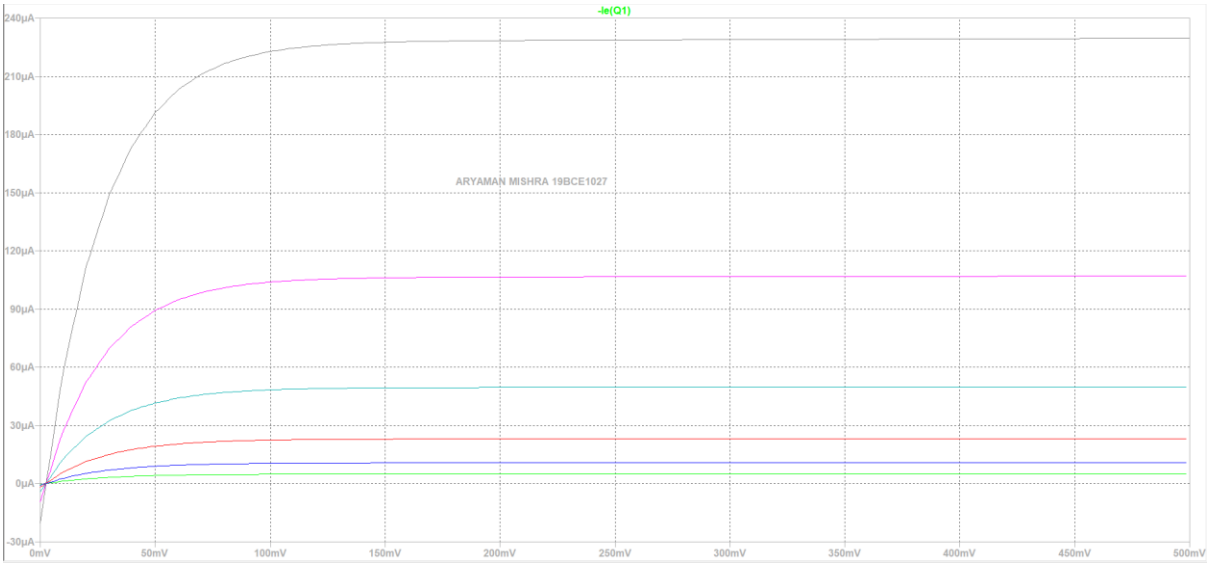
Plot 4 (Transistor in CB: Output Characteristics)



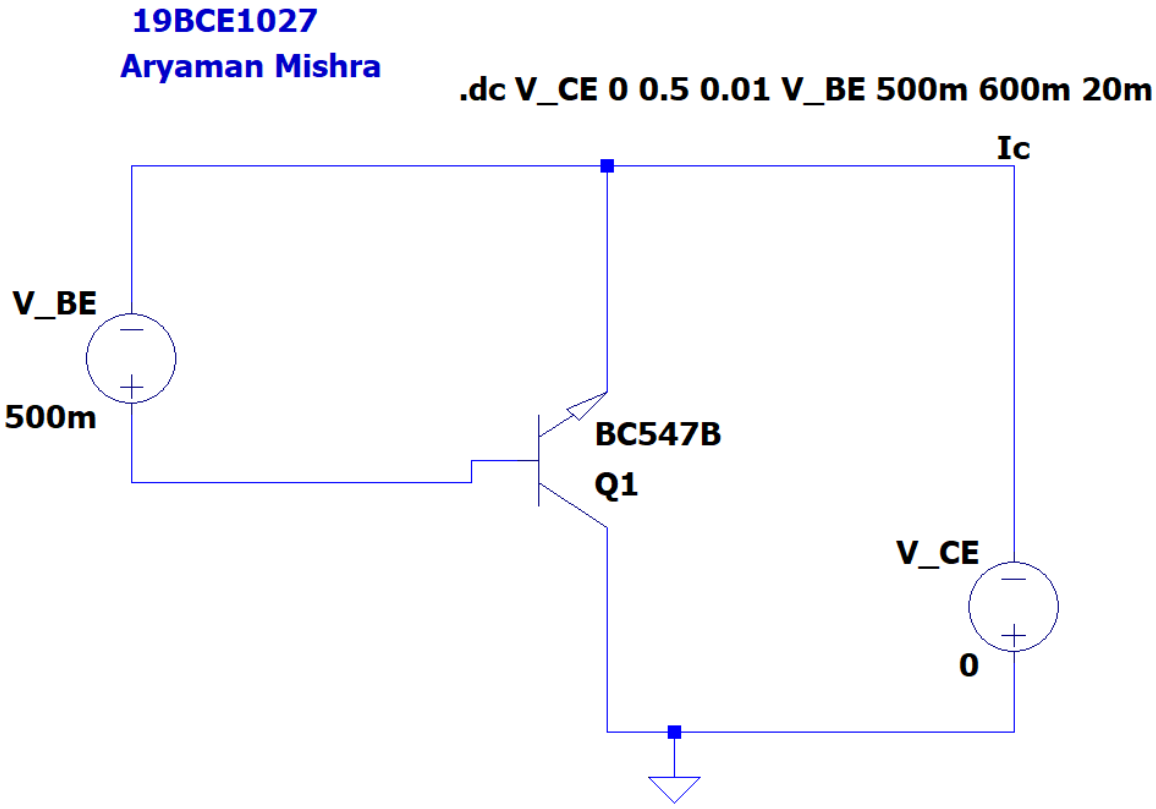
Circuit 5 (Transistor in CC: Input Characteristics)



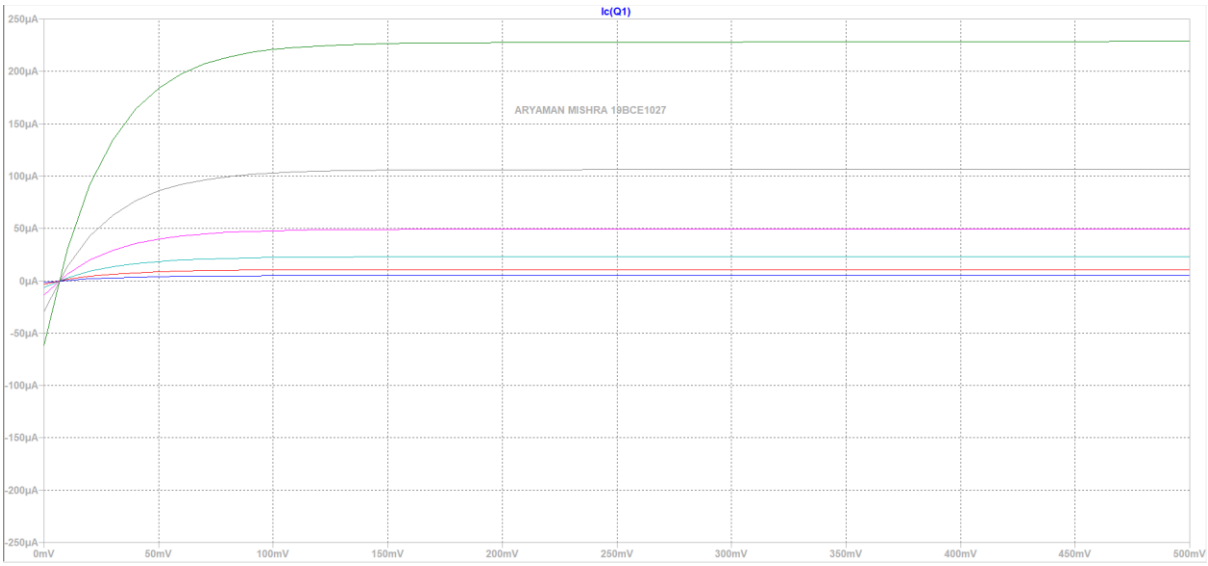
Plot 5 (Transistor in CC: Input Characteristics)



Circuit 6 (Transistor in CC: Output Characteristics)



Plot 6 (Transistor in CC: Output Characteristics)



INPUT AND OUTPUTS:

Components Used	Value
V_CE	12 Start Value: 0 Stop Value: 16 Increment: 4
V_BE	0 Start Value: 0 Stop Value: 1 Increment: 0.01
RB	2k Ohm
RC	62k Ohm
Q1	BC547B
V_BE	500mV CE Output Characteristics: Start Value: 500mV Stop Value: 600mV Increment: 20 CC Input and Output Characteristics: Start Value: 500mV Stop Value: 600mV Increment: 20mV
V_CE	0 CE Output Characteristics: Start Value: 0 Stop Value: 20 Increment: 0.01 CCInput Characteristics: Start Value: 0 Stop Value: 2 Increment: 0.01 CC Output Characteristics: Start Value: 0 Stop Value: 0.5 Increment: 0.01
V_EE	500mV Input Characteristics: Start Value: 0 Stop Value: 5V Increment: 0.01 Output Characteristics:

	Start Value: 500mV Stop Value: 600mV Increment: 20mV
V_CC	0 Input Characteristics: Start Value: 0 Stop Value: 4 Increment: 1 Output Characteristics: Start Value: -1 Stop Value: 20 Increment: 0.01
R1	1k
R2	1k

Conclusion: Hence we obtain the Input and output characteristics of NPN Transistor circuits.