

EC160 LAB Experiment 2.

Name : Snehal Keshav Nalawade

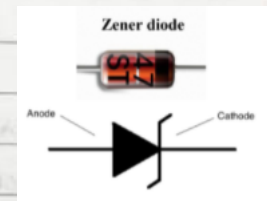
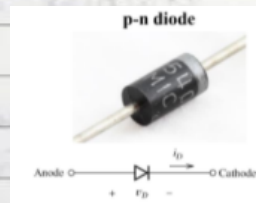
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Objective : Study of normal and Zener diode characteristic

Code number of i) Normal diode : 1N4148

ii) Zener diode : EDZV6-2B

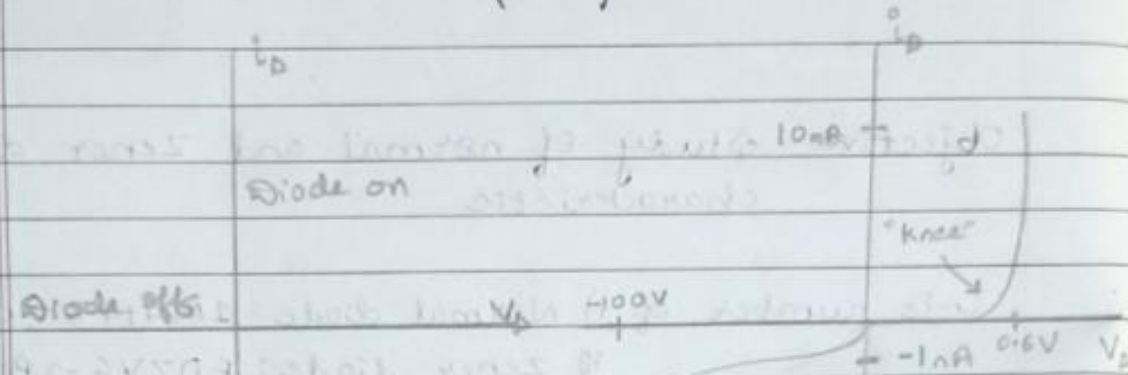
Theory : A diode is a non linear circuit element. The symbol of a diode and a real commercial diode :-
(generally there is a band marked at its cathode for its identification)



There exists another type of diode known as Zener diode, which has a heavily doped PN junction :-

For diode Current (I_D):

$$I_D = I_S \left(e^{\frac{V_D}{V_T}} - 1 \right)$$



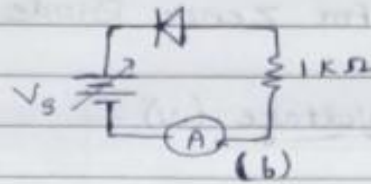
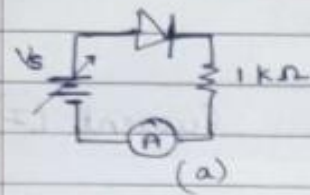
a) Ideal diode characteristic

b) I-V characteristics of a Practical diode

The diode circuits generally operate with varying inputs, which will move the instantaneous operating pt up and down a region of the characteristics.

r_d (Dynamic or AC Resistance)

$$r_d = \frac{\Delta V_D}{\Delta I_D}$$



(a) → forward bias

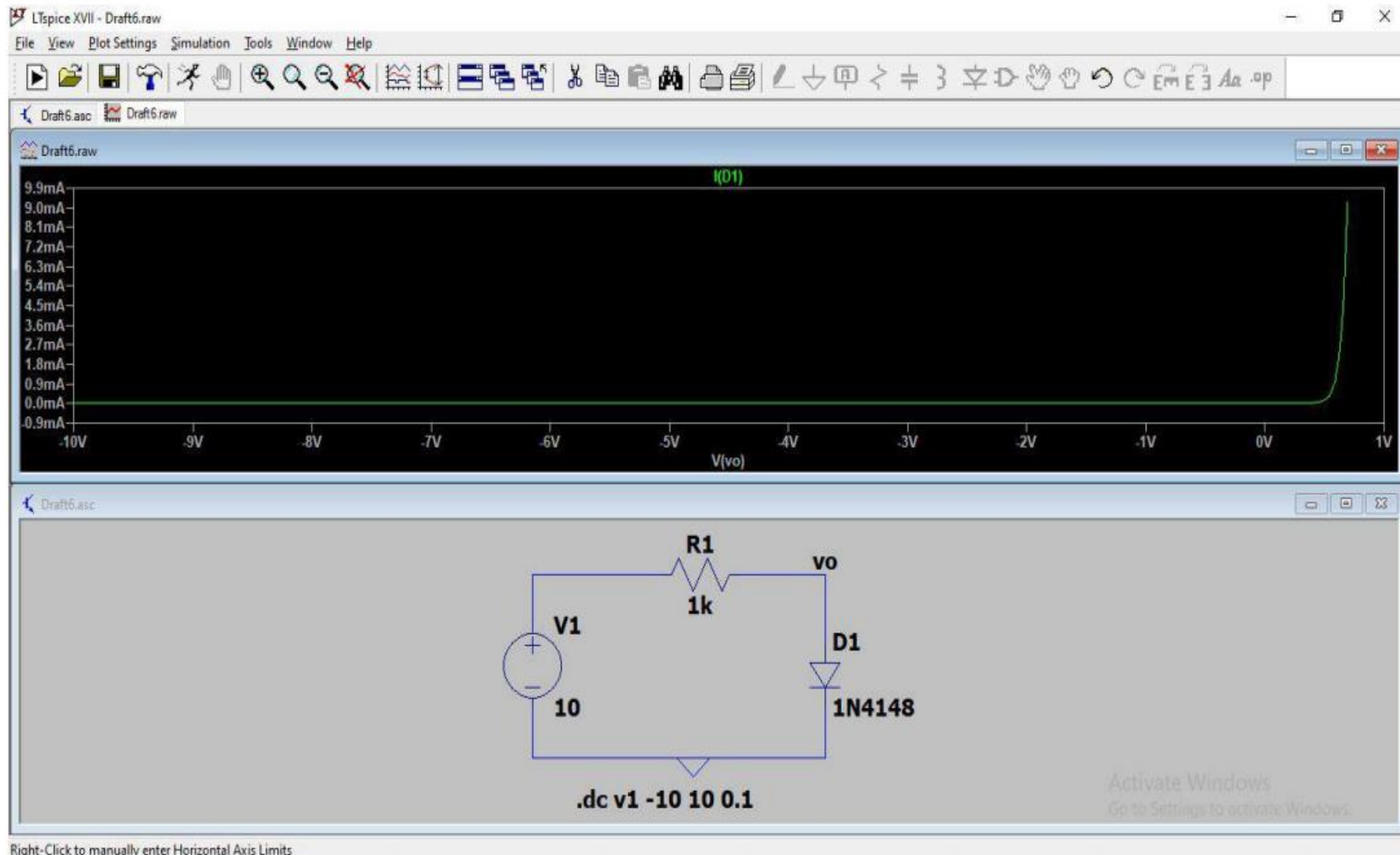
(b) → reverse bias

observations:

Table 1: For Normal Diode

	Applied Voltage (V)	Current (A)
1.	0 V	31.6×10^{-9}
2.	0.1 V	20.12×10^{-9}
3.	0.2 V	205.37×10^{-9}
4.	0.3	1.99×10^{-6}
5.	0.5	160.98×10^{-6}
6.	0.59	1.44×10^{-3}
7.	0.62	2.15×10^{-3}
8.	0.633	2.86×10^{-3}
9.	0.654	4.5×10^{-3}
10.	0.675	6.8×10^{-3}
11.	0.686	8.58×10^{-3}
12.	0.69	9.3×10^{-3}

Normal diode



Right-Click to manually enter Horizontal Axis Limits

Table 2: For Zener Diode

	Applied Voltage (V)	Current (I)
Forward Bias		
1	0.0V	66 pA
2	0.49	28.76 nA
3	0.74	3.96 nA
4	0.779	1.139 mA
5	0.816	4.64 mA
6	0.835	9.16 mA
Reverse Bias		
1	0.8V	1.6 pA
2	1.6V	2.64 pA
3	3.2V	31.72 pA
4	5.6	122 nA
5	6.15	2.3 nA
6	6.189	1.01 mA
7	6.191	2.2 mA
8	6.194	3.805 mA

Zener diode

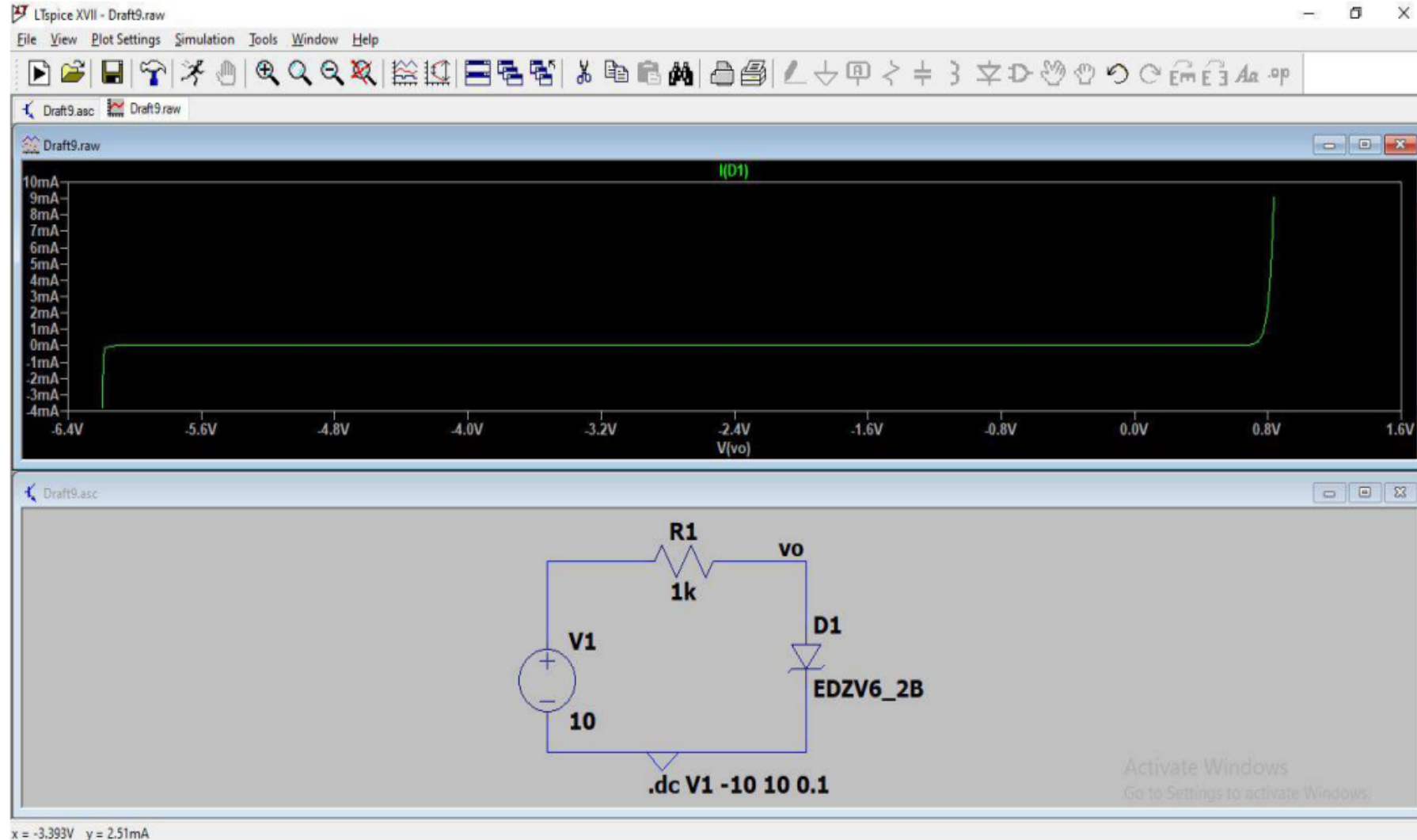


Table 3: Results

1	Threshold voltage of Normal diode (V)	0.59 V
2	Static resistance of Normal Diode (Ω)	521 Ω
3	Dynamic Resistance of Normal Diode (Ω)	29 Ω
4	Threshold voltage of Zener Diode (V)	0.779 V
5	Zener breakdown voltage (V)	6.189 V

Thank you