Class Assignment 04

Submitted on time? (YES/ NO): Yes

Task 01: Complete the Table 01. **50 points**

Task 02: Attach screenshots of the simulated circuit of the experiment showing all Multimeter/ simulation readings as mentioned in the class. **30 points**

Task -03: Answer to the given question. **20 points**

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Task: 01

Table 4.1: Data for I - V characteristics

V (volts)	V_R (volts)	Vz (volts)	$I_Z = V_R / R$ (mA)
0.1	9.448 µV	99.991 mV	19.999 nA
0.7	66.13 µV	699.934 mV	139.988 nA
1.0	94.472 µV	999.906 mV	199.984 nA
3.0	283.414 µV	3 V	599.965 nA
5.0	92.521 mV	4.907 V	196.848 µA
6.0	1.044 V	4.956 V	2.221 mA
10.0	5.013 V	4.987 V	10.665 mA

Table 4.2: Data for Load Regulation

POT_R (k ohm)	V_{220} (mV)	V_L (volts)	I_L (Amp)= $V_{220}/220$
1 k	897.643 mV	4.978 V	4.08 mA
3 k	340.542 mV	4.984 V	1.548 mA
5k	210.119 mV	4.986 V	955.092 µA
9k	118.981 mV	4.986 V	540.828 µA
10k	107.341 mV	4.986 V	487.92 µA

Table 4.3: Data for Line Regulation.

V (volts)	V_L (volts)
1.0	721.844 mV
3.0	2.166 V
6.0	4.331 V
9.0	4.97 V
10.0	4.978 V
11.0	4.983 V
12.0	4.988 V

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Task: 02

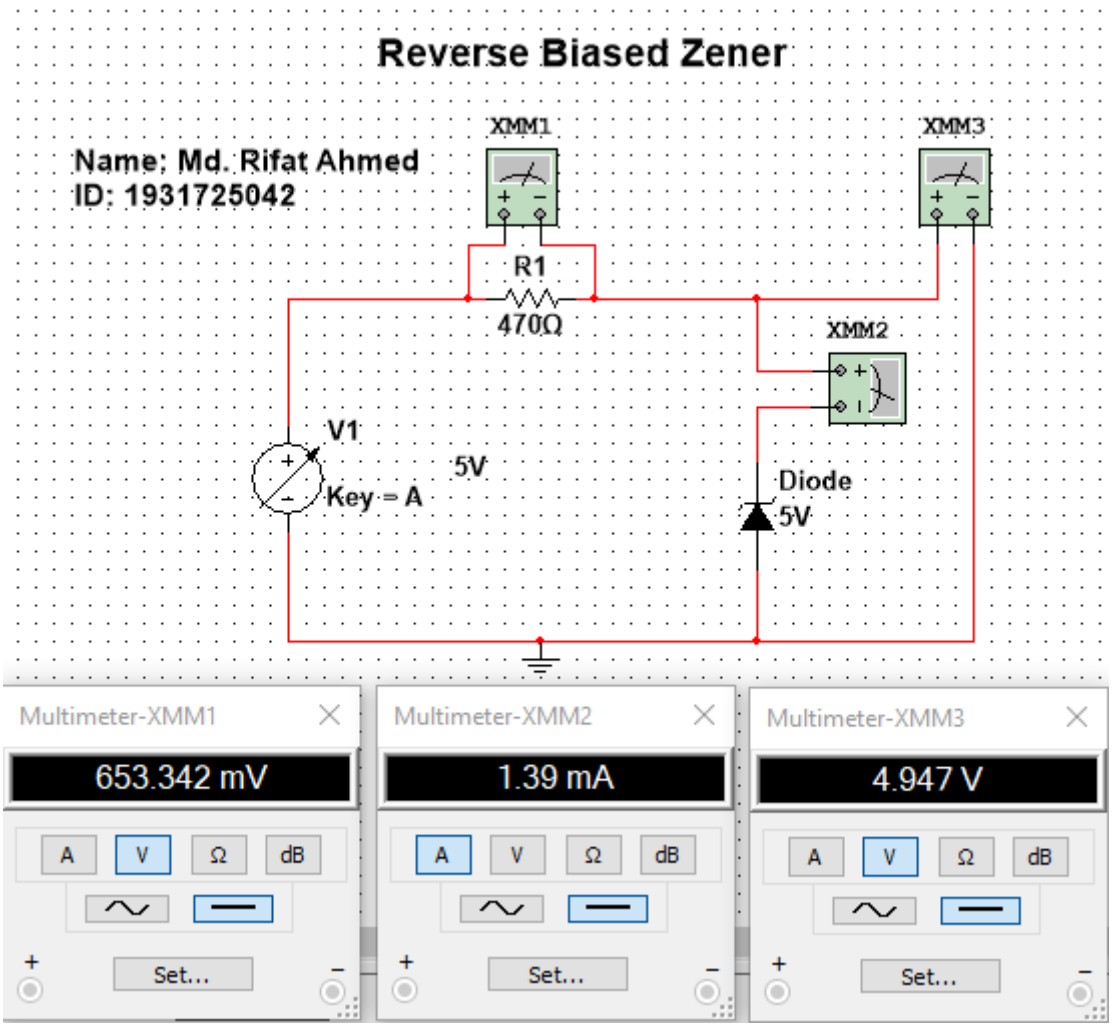

Figure 1: Reverse Biased Zener Circuit

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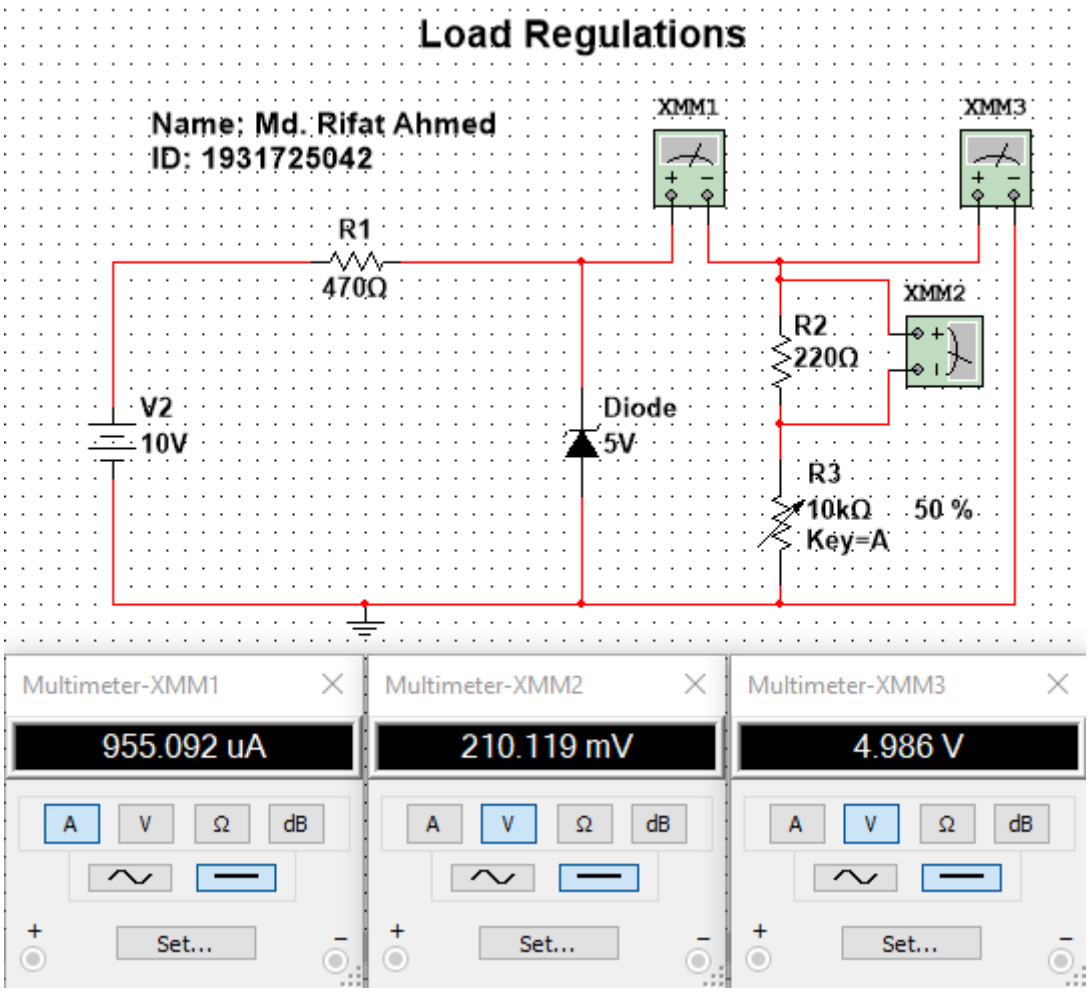

Figure 2: Load Regulations Circuit

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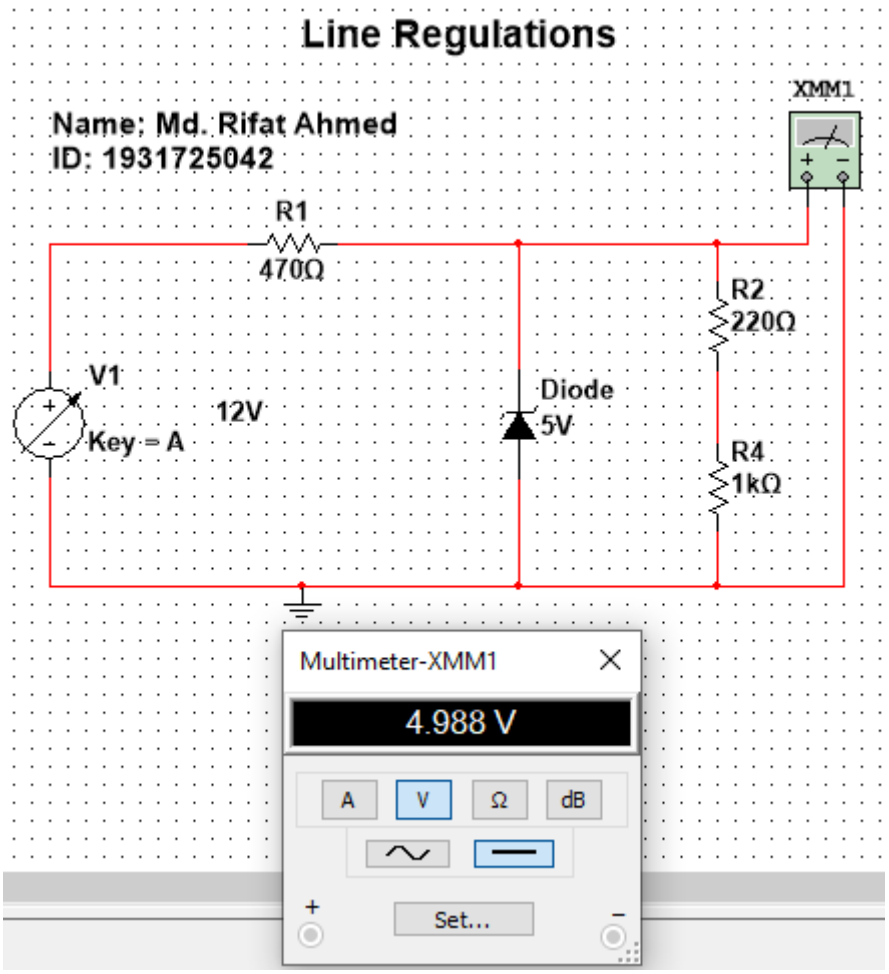

Figure 3: Line Regulations Circuit

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Task: 03

1. What is the difference between a Zener Diode and a diode?

Ans: A normal diode only conducts in the forward bias region and does not conduct when reverse biased because they might be damaged if they're reverse biased. But on the other hand, a Zener diode can conduct in three regions: forward, leakage and breakdown. In forward bias region it acts like a normal silicon diode, in the leakage region it can conduct a small amount of reverse saturation current and in the breakdown region it works for a fixed amount of voltage.

2. What is called a Zener Voltage?

Ans: The voltage that causes a diode to enter the Zener region in the negative bias region is called Zener voltage (V_Z).