North South University

Department of Electrical & Computer Engineering

LAB REPORT

Spring 2021

Course Code : EEE 111

Course Title: Analog Electronics - I

Section: 7

Experiment Number: 01

Experiment Name:

I-V Characteristics of diode

Experiment Date: 02 / 03 / 2021

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Course Instructor: Syeda Sarita Hassan

Submitted To: Fatema Zahra

LAB REPORT-01

Name of experiment: I-V Characteristics of diode

Objective:

The objective of this experiment is to study the I-V Characteristics of diode

Equipments and Components:

Serial no.	Component Details	Specification	Quantity
1	P-n junction diode	IN4007	1 piece
2	Resistor	1 KΩ	1 piece
3	DC power supply		1 unit
4	Signal generator		1 unit
5	Trainer Board		1 unit
6	Oscilloscope		1 unit
7	Digital Multimeter		1 unit
8	Chords and wire		as required

Theory:

A diode is a bi-polar (one end is positive and another is negative). A diode can be in two states depending on the direction of power. If a diode's positive end is connected to a power supplies positive end then it will be in forward biasing and behave as a short circuit. And if the diode's positive end is connected to the power supplies negative end then it'll be in reverse biasing and behave as a open circuit.

Circuit Diagram:

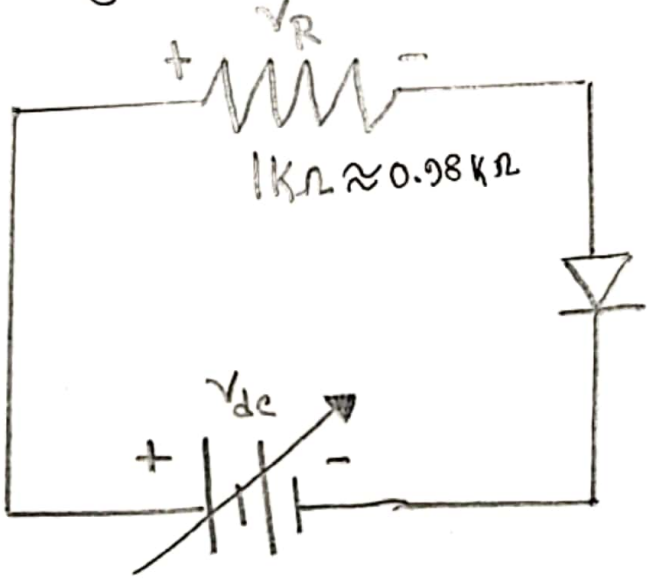


Fig: Circuit Diagram of a forward biasing diode

Data Table :

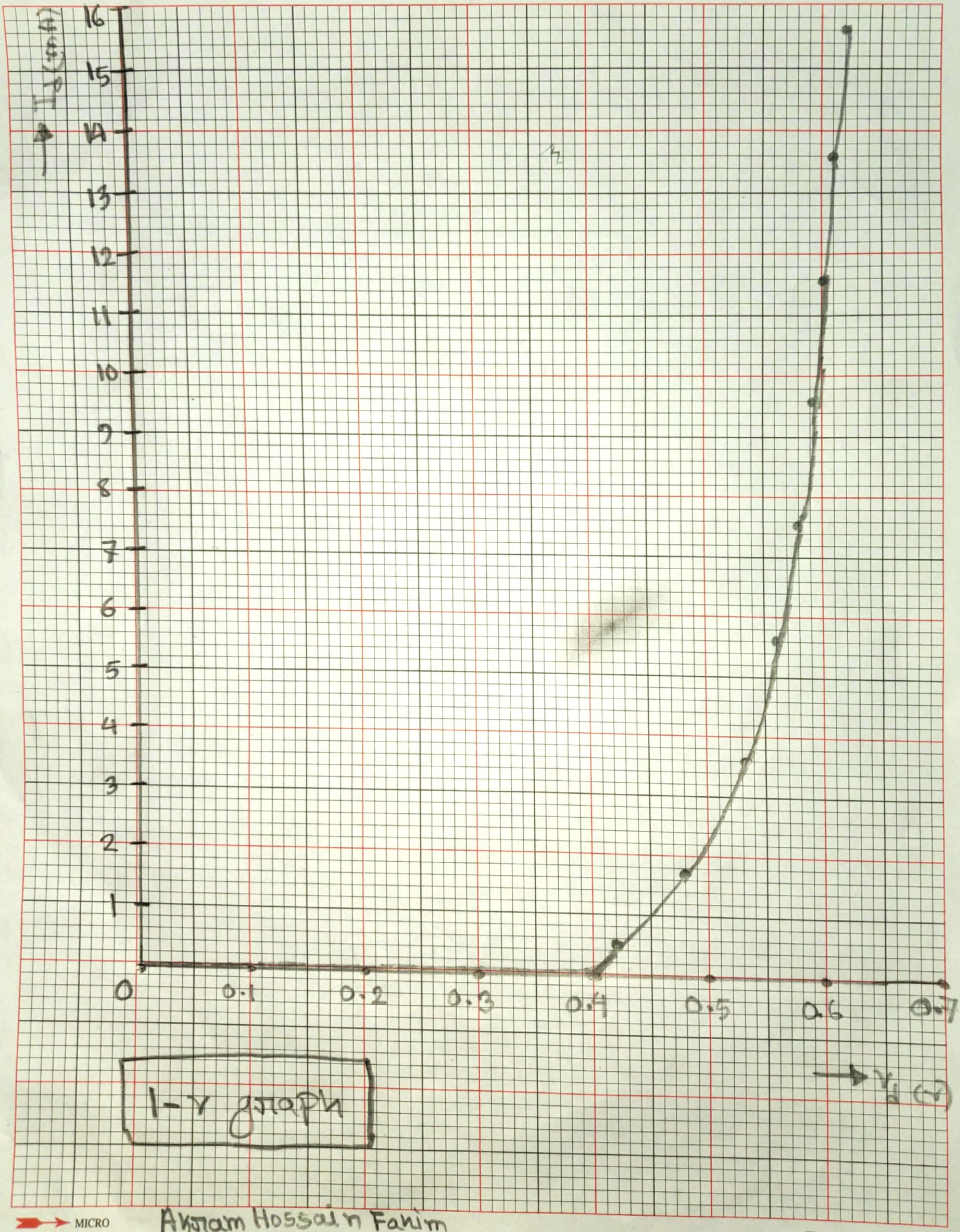
V_{dc} (V)	V_d (V)	V_R (V)	$I_d = V_R/R$ (mA)
0	0	0	0
1	0.42	0.57	0.58
2	0.48	1.51	1.54
4	0.53	3.46	3.53
6	0.56	5.43	5.54
8	0.58	7.41	7.56
10	0.59	9.40	9.59
12	0.60	11.39	11.62
14	0.61	13.38	13.65
16	0.62	15.37	15.68

Questions :

① Draw the I-V characteristics curve of diode from the reading obtain in this experiment.

Ans: The graph of the curve has been attached with the lab report.

Roll No. .....



MICRO

Akram Hossain Fahim
181 2724042

KF 8 Inch x 10 Inch

② Calculate the static resistance for $I_d = 5mA$ and $I_d = 10mA$.

Ans:

We know,

$$R_d = \frac{V_d}{I_d}$$

For $I_d = 5mA$, V_d is 0.55V. (from graph)

$$\therefore R_d = \frac{0.55V}{5mA}$$

$$= 110\Omega$$

For $I_d = 10mA$, V_d is 0.595 V (from graph)

$$\therefore R_d = \frac{0.595V}{10mA}$$

$$= 59.5\Omega$$

③ Determin the Q-point for the circuit in figure -6, when $V_{dc} = 8$ volt.

Ans:

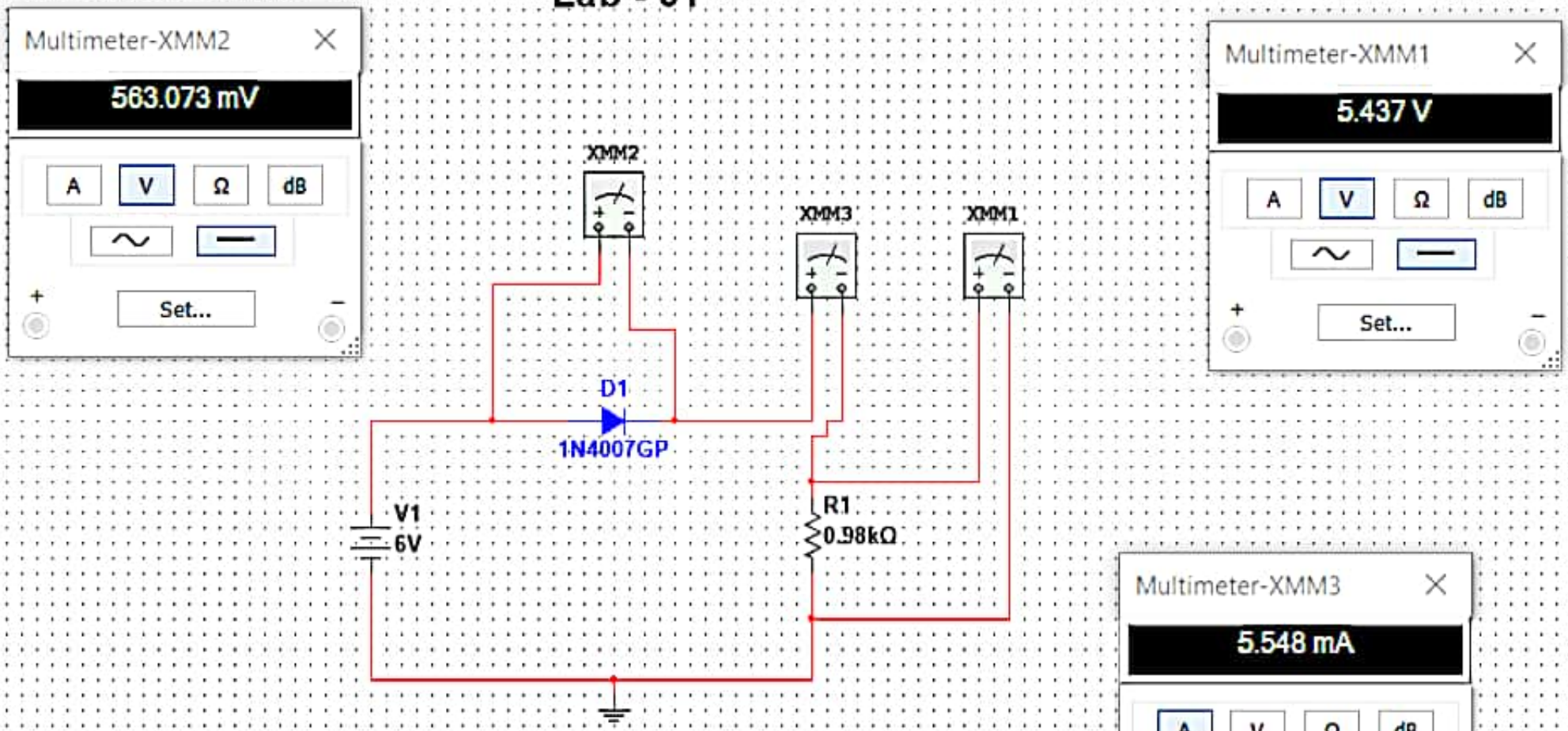
From the data table we can see for 8volt V_{dc}, V_d is 0.58 volts and I_d is 7.56 mA.

So the Q-point is (0.58, 7.56)

Discussion:

In this experiment we learned about how a diode functions depending on the direction of power. We have experimented with a forward biasing circuit to learn about the threshold voltage of the diode. which in this case was between 0.6v-0.7v. We have also simulated the circuit in multisim.

Lab - 01



Akram Hossain Fahim

1812724042